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IN THE MATTER OF Sections 12(2) and 12(3) of the *Environmental Assessment Act*
R.S.O. 1990, c. E.18, as amended

- and -

IN THE MATTER OF a Notice by the Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. EA 87-02) of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown lands in Ontario.

BEFORE: Anne Koven - Chair
Elie Martel - Member

APPEARANCES

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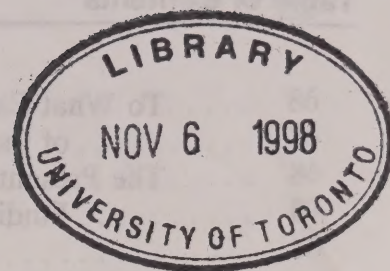


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ENVIRONMENTAL ASSESSMENT BOARD

Hearing on a Class Environmental Assessment for Timber Management on Crown Lands in Ontario

DECISION SUMMARY

Can timber management planning for building forest access roads, cutting timber, regenerating the new forest and tending and protecting it in over 385,000 square kilometres of public lands in northern Ontario pass the test of approval under the *Environmental Assessment Act*?

Yes. The Ministry of Natural Resources' class environmental assessment is acceptable and we, the Environmental Assessment Board, approve the undertaking of timber management planning submitted to our hearing.

Simply, our decision speaks to sustaining a healthy forest. We had to be persuaded that the planning process we would approve would be able to manage our forest as a perpetual renewable resource, carefully balancing the need for timber with the protection of equally important assets such as old growth white and red pine, wildlife, water and recreation.

We are convinced by all we heard and saw that it is Ontario's good fortune to possess a forest environment that sustains both non-consumptive uses and industrial exploitation: the choice is not between protecting the environment and jobs. We also enjoy in this province public ownership of most of the forest land through the Crown; forest management in Ontario is accountable to the public, not to private interests.

Ontario's forests and their management are different from the squandering of the Amazon rain forests or the cutting of huge, ancient cedars and Douglas firs in British Columbia. The

spruce, jack pine and balsam fir in Ontario's northern boreal forest have a shorter lifespan than West Coast species, reaching maturity at ages of 60-100 years. Their natural reproduction cycle requires destruction of large patches of older trees by fire, insects or wind to make way for new growth. We believe the characteristics of most of Ontario's conifer species lend themselves, under careful regulation, to a renewable timber supply. On the other hand, the old growth white and red pine in Temagami have been defined by the public to be more valuable left standing and we order conditions to protect them. We are also ordering the Ministry of Natural Resources (MNR) to take special measures province-wide to ensure habitat for two wildlife species that prefer older forests, the pine marten and the pileated woodpecker.

From May of 1988 to November of 1992, we heard evidence and argument for 411 days. The record grew to 70,000 pages of daily recorded transcripts and 2,300 exhibits comprising hundreds of thousands of pages of supporting material. A list of the major intervenors, their counsel or representatives and the 500 people who made submissions to us are listed in appendices at the end of this report. The hearing was a long and expensive process. We do not think a price tag can be put on what is at stake: the protection of forest resources valued and enjoyed by all Ontarians, the stability of northern Ontario communities and their economy, and the future of Ontario's forest industry.

We commend the stamina and commitment of the intervenors in opposition to and in support of MNR. They exhausted their resources way beyond the \$1.83 million of intervenor funding allocated to some of them during a process no one predicted would last for over four years. Even the Ontario Lumber Manufacturers' Association was forced to drop out of the hearing for lack of money. The influence of the intervenors is clearly seen in all parts of our decision. While the individual parties, including MNR, may feel they lost out on particular issues, our central responsibility was to ensure the protection, conservation and wise management of the forest environment, not to arbitrate disputes among the parties. The participation of the intervenors pushed MNR into changing its attitudes and operations for the better while the hearing was going on.

The intervenors were at a disadvantage against the huge bureaucracy of MNR, which was seen as arrogant and as having run its own show in northern Ontario for many years with a monopoly on forest information and experts. The judgement, honesty and ability of MNR to respond to the public's demand for change – not merely go through the motions of doing so – were tested at the hearing. In our opinion, MNR began to make long overdue changes during the 1980s with the implementation of their timber management guidelines for the protection of what are called "non-timber values," a catch-all term for the varied resources and qualities of the forest that could be at risk from timber operations. The hearing

accelerated this progress and our decision requires MNR to do even more and to deliver on its good intentions and promises.

Our approval is given only if MNR complies with a long and detailed set of conditions, many of which were negotiated by the parties to the hearing. Others we require based on the identified problems and the best solutions submitted in the evidence before us. Some of these Conditions of Approval come into effect immediately, others impose deadlines for MNR to complete research and investigations over the nine years our approval is in effect. When our approval lapses in the year 2003, the Minister of the Environment and Energy will face the decision to extend or change it. Its temporary term means our approval will be tested in the forest. The successes and failures of the timber management planning process will be demonstrated. The results of monitoring will prove if MNR is protecting non-timber values. The results of research into biodiversity conservation and landscape management will show if these are more than good ideas and can actually be implemented and produce the benefits we expect.

Our decision does not challenge the many different philosophies held by the people of Ontario about their forest. All are legitimate and accommodation is possible, in our view, between the extreme ends of the debate among those special interests who wish to see our forest left in a natural, undisturbed state and other interests who see its first purpose as raw material for mills and paper plants. The environmental assessment process and the hearing gave voice to everyone's concerns. No one can claim credibly that important issues were ignored or that scientific developments or new findings were excluded from discussion or our consideration.

The four years during which we conducted the hearing saw enormous changes as the public became better informed and more demanding about protecting the forest environment. The science of forestry moved in new directions. We were several years into the hearing when the new forestry concept of sustainability was brought to our attention by the intervenors. MNR did not stand still while the hearing was under way. It continued to manage the forest under an exemption from the Minister of the Environment and Energy and improved its management techniques and approaches, often in line with the ideas proposed at the hearing. It launched new studies on matters relevant to timber management planning such as forest sustainability, the protection of old-growth and wildlife, the status of forest renewal and the use of forest resources by Aboriginal peoples.

MNR put before this hearing its scheme for managing the timber resources of a vast public forest, more than five times larger than the province of New Brunswick. This large and varied terrain, stretching from the Manitoba border almost to Peterborough and Ottawa, was

called at the hearing the "Area of the Undertaking." Readers will encounter this shorthand term often in this decision.

The Course of the Hearing

In Chapter 1 of the decision, we provide an overview of the events leading up to the hearing and of the hearing itself. This is followed by several pages of statistical summaries, maps, an acronym list and a glossary.

Legal Issues

Environmental assessment in Ontario is a legal process mandated by the *Environmental Assessment Act* of 1975. This legislation directed the Ministry of Natural Resources in preparing its class environmental assessment, provided for the decision of the Minister of the Environment and Energy to send the matter to a hearing before the Environmental Assessment Board, and guided our decision to accept the environmental assessment and approve the timber management planning application. Our decision is legally binding on MNR and can only be changed by the Minister of Environment and Energy and the Cabinet to which an appeal can be made within 28 days from today's date of approval. The appeal deadline, however, can be extended by the Minister. We discuss legal issues in Chapter 2. In our view, the adversarial disputes among lawyers and parties to the hearing can fix on legal and procedural matters that divert attention away from the public's interest in making good decisions that protect the environment.

We were persuaded by the Ministry of the Environment and Energy to take the unusual step of ensuring that MNR's next revision of its Timber Management Planning Manual, to be drafted during the year following this approval, is in compliance with our terms and conditions. Parties will have a chance to make written submissions to the Board if they believe the revised manual does not accurately reflect our approval.

MNR chose to define its undertaking narrowly as timber management and specified the undertaking's purpose as "to provide a continuous and predictable supply of wood for Ontario's forest products industry." Many people would have wanted this hearing to aim at broader goals, bringing together all the aspects of the forest Ontarians value. The law is very clear, however, that this Board does not have authority to change the undertaking as chosen by MNR. This caused frustration to some parties at the hearing. We are confident, nonetheless, that under our Conditions of Approval timber management in Ontario will protect all the values of the forest. We were also told by senior MNR officials late in the

hearing that the ministry is moving well down the road to some kind of integrated forest management, and we would not be surprised to see the undertaking redefined along these lines by the time the nine-year term of our approval expires.

Because this is the first class assessment to undergo a hearing, we consider in Chapter 2 the difference between this approach and environmental assessments that have been heard for individual projects or undertakings. The "class" of undertakings for timber management planning involves 90 individual Plans, developed every five years for each forest management unit, covering the many road building, logging, regenerating and tending and protecting operations done across the Area of the Undertaking every year. We were satisfied by the evidence we heard that these timber operations are sufficiently repetitive and interdependent to be part of a common planning process. We were also satisfied that their potential effects and mitigative measures are understood well enough for a class environmental assessment to be approved.

The Planning Process

The timber management planning process we are approving and the conditions that will make public participation in decision-making a reality are described in Chapter 3. The four-stage program requires MNR to work with the public over a two-year period in developing each Plan. Opportunities for influencing the content of each Plan are offered to everyone in the province with a stake or interest in timber management planning. Our approval requires the creation of Local Citizens Committees with powers to give local residents membership on MNR planning teams and a direct say in their decisions. We also require the creation of advisory groups at the regional and provincial level to guide MNR's decisions and oversee its performance. The membership of these committees will be drawn from groups representing tens of thousands of Ontarians, such as Forests for Tomorrow and the Ontario Federation of Anglers and Hunters, who were parties to the hearing and have a provincial interest in the management and protection of our forests.

The lines of responsibility for carrying out timber management planning in compliance with our approval are not held by a faceless bureaucracy but are clearly delineated, beginning with the Plan author and the planning team to the district manager and the regional director. If the choices in timber management planning were to flout the public's wishes, this would be clearly recorded in the Plans and other monitoring and reports we require. There will always be some disagreements, but our approval anticipates that MNR's greater accountability, especially to the new Local Citizens Committee for each management unit,

will lead to better choices, better understanding and more support for timber management operations.

Forest Roads

Road building, its environmental impacts and the ways to avoid or deal with adverse effects are discussed in Chapter 4. Road construction will likely slow down because MNR has stopped paying for roads through the Forest Management Agreement program. Also, a map of the existing 33,000-kilometre network of primary and secondary roads shows that much of the Area of the Undertaking has been partially accessed. We found that erosion and sedimentation of waterbodies, identified as the major potential adverse effects associated with roads, are adequately dealt with in the planning approach and the guidelines developed for road construction and protection of water.

An especially contentious issue is restricted use of forest access roads. Some of the public believes roads built on Crown land with taxpayers' dollars should be fully open to public traffic. MNR submits that sometimes restrictions are needed, usually to protect lake access to remote tourist operations and fisheries. We observe that 80% of forest roads have no restrictions whatsoever, although "use management" plans including road restrictions are required in timber management planning. This issue will continue to irritate and anger the public but the planning process will now identify the reasons for road restrictions well in advance of construction.

We found that many people at the hearing want to preserve roadless wilderness areas. We were not convinced that decisions about wilderness areas could be usefully made at the local level in each Plan and we are ordering MNR to develop a provincial policy on roadless wilderness areas by 1997.

Harvest

Many people worry that we are logging too much timber too quickly with the eventual destruction of the forest as the outcome. We consider the question in Chapter 5: what is the level of cutting our forest can sustain over the long term while protecting the forest environment and its non-timber values? The answer is found in MNR's approach to sustained yield management.

MNR determines the theoretical upper limit or ceiling on the amount of timber that can be cut through a mathematical calculation called Maximum Allowable Depletion (MAD). The

actual harvest area is much lower than the MAD allowance. For example, in 1991 the harvest area was estimated at 175,000 hectares compared with the 443,792 hectares allowed for cutting. Because the forest changes – its inventory is depleted by logging and fires, for example, and added to by regenerating stands – the MAD is recalculated every five years for each of the 90 Plans. This means the amount of timber that is permitted for harvest and the associated level of sustained yield cannot be constant over time; changes in the forest will be reflected in allowable harvest levels that may be higher or lower than the previous Plan. No convincing evidence was put before us that the Ontario forest industry is facing a timber shortage today or that one is likely in the future. MNR's evidence and experience demonstrate that foresters are capable of forecasting local supply shortages and solving these problems, for example by exchanging wood from other locations in the Area of the Undertaking.

Another factor we had to consider in preventing over-cutting of our forests is that timber management is a recent development in Ontario, relative to Europe where forests have been logged for hundreds of years. We are still cutting our original or virgin forests. Regeneration treatments were not significant until the late 1960s and it will be many years before our second-growth forest will reach maturity at rotation ages of 60 to 100 years or more. For these reasons, much of our forests consist of older-age trees, which are suitable for harvest. The public sees a risky proposition in liquidating these older stands for timber supply, displacing or destroying the non-timber resources in the process, and maybe discovering many years from now that our regeneration efforts have failed.

We find that MNR's program of Forest Resources Inventory, as improved under the conditions we order, and the existing rule of excluding harvested areas from the MAD land base until they have been declared successfully regenerated, are adequate to prevent over-cutting.

There remains one missing link: a single document spelling out demand and supply projections and regeneration needs for the province, including Ontario's sustained yield objectives for producing a continuous and predictable supply of timber to the industry while protecting all aspects of the forest. The existing forest production policy is 20 years old and practically useless. We are ordering MNR to prepare within two years a new provincial timber production policy that will develop numerical objectives for timber harvest and regeneration, in consultation with the public. Our decision and Condition of Approval set limits on the amount of timber that can be cut and we have no evidence that the supply available to the forest industry will be inadequate to meet its future demands.

MNR and the forest industry failed to convince us that limits on clearcut size are unnecessary. The scientific evidence demonstrates that clearcutting is an acceptable harvesting practice for the boreal forest, but clearcuts should be done in a range of sizes; too many small or large cuts on the forest landscape can be harmful. We learned our northern conifer forests regenerate naturally only if they are periodically destroyed by events such as fire and blow-down. Clearcutting can serve in some ways as their proxy for creating patches of disturbance that remove stands of older trees, permitting the new forest with dense stands of softwood species such as spruce and jack pine to grow in the unshaded surroundings their biology requires. Our decision to impose limits on clearcut size was influenced by what the public told us; most people see unrestricted clearcuts as aesthetically offensive, too destructive to other forest values and unwise and risky in the absence of demonstrated success that we can regenerate cutovers in line with our long-term expectations.

We found that clearcut size has decreased since the introduction of the 1988 Timber Management Guidelines for the Protection of Moose Habitat. We are imposing clearcut size limits on the basis of these guidelines; clearcuts will be done in a range of sizes that will not exceed 260 hectares, with exceptions permitted only in circumstances the forester can justify such as salvage operations of timber damaged by fire, insects or blow-down or the need to provide wildlife habitat. This is not an impractical restriction. We see in the 17 Plans MNR showed us for 1991-1996 that, with the exception of a few large clearcuts for biological reasons, the sizes conform to our limit of a range of sizes up to 260 hectares.

Regeneration

The public is demanding that the timber resource be renewed. In Chapter 6, we examine the performance of MNR and the industry in regenerating the forest that has been logged. The results of MNR's measurements of regeneration success – primarily the height and density of stands within the first 20 years of their growth – are encouraging. We observed that the forest grows back after all disturbances – logging, fire or insect damage – and nowhere did we see wastelands or biological deserts as the public fears.

The issue of artificial versus natural regeneration was debated at the hearing. The artificial methods of planting and seeding and the associated activities of site preparation and tending are more expensive than natural regeneration. The majority of timber supply comes from conifer species in the northern boreal forests. About 35% of this conifer harvest is being regenerated by planting and another 15% by seeding, amounting to 100,000 hectares treated by artificial regeneration in 1991. Natural regeneration is used on the remaining 50% of

the conifer harvest in the boreal forest but the evidence suggests that the commercial species will regenerate more slowly and in smaller volume compared with sites planted or seeded. Virtually all of the harvest of such species as poplar and maple, mostly in the more southern Great Lakes-St. Lawrence forest, is also regenerated by natural methods. Given that natural regeneration is used more extensively than artificial means, we believe there is little basis to suggest that our forests are being turned into plantation farms devoid of the natural characteristics of the original stands.

We are convinced that artificial regeneration on some sites is essential to renew the spruce and pine required by the industry. Continued artificial regeneration is the price, as we see it, that must be paid if timber is to be supplied to the forest industry.

We have concerns about the province's decreasing financial commitment to artificial regeneration: the adverse effects of cutting timber without investing in artificial regeneration are unacceptable. We are ordering regeneration objectives and financial commitments to be set in the timber production policy. The public will not accept a return to the old practice they described as "cut and run" where timber was taken with little planning or effort to grow back a healthy new forest.

Tending and Protection

Chemical and biological substances have two purposes in Timber Management Planning: herbicides are used for site preparation and tending and insecticides are used to control insects. The use and regulation of pesticides and their potential adverse affects are discussed in Chapter 7.

Tending the forest mostly involves knocking back competitive vegetation such as grasses, shrubs and poplar for a couple of years to give the slow-growing conifer species a chance to get established on sites where they have been planted or seeded. Most tending is done by aircraft spraying 2,4-D and glyphosate because the use of herbicides is more feasible, effective and cheaper than manual or mechanical methods. We became convinced by the evidence of expert witnesses that herbicide tending is essential to the regeneration of future conifer timber supply, but nevertheless we looked carefully at the evidence for all indications of adverse environmental effects or danger to public health. We were reassured by the evidence we heard about the approval for safe use of these herbicides in forestry by the Federal and Ontario governments, the United States and other jurisdictions.

Aerial herbicide spraying operations are carefully planned and executed. Sites are sprayed usually only once over 60 to 100 years and on a relatively small area annually, as shown by the 61,459 hectares sprayed in 1991-92. The amount of herbicides sprayed in our northern forests is small compared with household and agricultural use of the very same chemicals in southern Ontario. Our Conditions of Approval require public notice of spray operations in the Plan and the Annual Work Schedule, identification of areas to receive herbicide spraying, detailed descriptions of spray projects and post- operation reports.

The spraying of chemical insecticides for forestry has worried the public and has been politically debated for years in Ontario. In fact, since 1984 no chemical insecticide has been aerially sprayed on northern forests because of decisions by successive ministers of Natural Resources to spray only the biological insecticide bacillus thuringiensis, known as B.t. Since 1985, B.t. has been applied to about 1.2 million hectares of forest in Ontario. The amount treated each year has varied widely, from a low of 28,000 hectares in 1988 to a high of 736,000 hectares in 1986.

The forest industry asked us to overturn the minister's no-chemical policy. The industry argues biological insecticides can treat only three of the fifteen major insect pests found in the Area of the Undertaking and, even for these three are less effective than chemicals. The industry said chemical insecticides are approved for safe use in forestry and regulated carefully by the Federal and Ontario governments.

Forests for Tomorrow made the opposite argument, calling for a permanent ban on spraying of all chemicals – both herbicides and insecticides – in the Area of the Undertaking. No witnesses were called by Forests for Tomorrow to make this case and a written statement of evidence was withdrawn, in contrast to the large amount of evidence presented by expert witnesses called to testify on behalf of MNR and the forest industry.

MNR asked us to approve its proposed insect pest management program in place since 1980: "Where alternatives to chemical insecticides are commercially available, reasonably cost effective, and approved federally and provincially for use, the ministry will use such alternatives in preference to chemical insecticides." In our view, this program leaves the door open to possible future use of chemical insecticides seemingly in contradiction to the practice of the Minister of Natural Resources for the last eight years. The expert witnesses for MNR told us their regional working committees consider the use of chemical insecticides in planning the annual spray programs but have not recommended using chemicals since 1986 after determining adequate results could be obtained with B.t. MNR witnesses submitted all registered and approved chemical and biological insecticides should be

available for use in timber management planning should particular situations necessitate their use.

We are approving MNR's integrated pest management approach because we received no evidence convincing us the insecticides registered and approved for forestry in Ontario pose unacceptable risks to the environment or human health. In our opinion, however, it is unlikely any Minister of Natural Resources will go against the established practice of prohibiting the aerial spraying of chemical insecticides. To do so would require an exceptional circumstance, which has not happened in the past eight years. In this event our Conditions of Approval require a careful assessment and reasons for selecting chemicals and close public scrutiny, by members of Local Citizens Committees on the district and regional pest management planning committees, and through advertised notice of spray programs and a public information centre.

We see the minister's ban on chemical insecticide spraying as an instance where the public interest is better served by the political process than by leaving the decision to scientists, bureaucrats or special interests. In our view successive ministers have rightly adopted a cautious approach limiting the introduction of non-essential chemical substances into the forest environment.

Monitoring

In Chapter 8 we describe how the public will know if timber management planning is succeeding or failing to protect the forest. Our Conditions of Approval set up three types of monitoring to scrutinize and to assess the results of timber management planning.

The first is a system for judging the performance of MNR and the industry in following the requirements of the approved planning process. This is called compliance monitoring and it uses area inspections and audits. The second monitoring type is aimed at studying the environmental effects of timber operations and improving the effectiveness of MNR's management approach in protecting the forest environment. This work involves identifying local effects in the management unit as well as on the provincial scale and conducting multi-year, multi-million dollar research studies of the provincial guidelines for moose and fish habitat and tourism. Silvicultural effectiveness monitoring is the third program we are ordering. Growing back the forest is crucial to the success of timber management planning, therefore careful monitoring is needed of the effectiveness of MNR's silvicultural effort, especially regeneration.

In Chapter 8, we describe Conditions of Approval requiring monitoring results to be disclosed to the public and the Legislature in the Report on Past Forest Operations contained in each Plan, Annual Reports for the management units and the province, and a five-year State of the Forest Report. These reports form MNR's main written communication link with the public on all timber management planning matters.

Socio-Economics

Few people disputed the forest industry's claim of being the economic engine of northern Ontario. In Chapter 9 we describe the social and economic benefits of the forest industry as well as the negative effects of its operations on other forest users, all of which fall within the meaning of the environment in the *Environmental Assessment Act*. The forest industry is one of the largest, highest paying employers in northern Ontario. The evidence indicates the forest industry has a significant social and economic impact on almost two-thirds of the population of northern Ontario. We learned that the rest of Ontario benefits even more than the north: approximately 65% of the jobs associated with forestry are outside the Area of the Undertaking and only 2% of the industry's purchases are made in northern Ontario. We recommend the Ontario government investigate ways of keeping more of the economic benefits in the north, particularly in logging communities suffering higher taxes but lower levels of service than major mill towns.

At the hearing we saw first-hand the cyclical nature of the forest industry as it experienced a massive economic downturn associated with the recession. The industry asked of our approval that companies be provided with the flexibility in timber management planning to remain competitive in the world market. Our approval does this by providing the forest industry with the security of an adequate, affordable and continuous wood supply.

Our approval does not ignore the fact that timber operations can be highly disruptive on non-timber activities. Remote tourist operators fear being put out of business when the forest industry moves into their area with roads and logging. We are persuaded that these effects can be minimized by the timber management guidelines on the protection of tourism values, on visual resources and on road access. The long-term monitoring studies and the prominent participation we expect from tourist operators on Local Citizens Committees will also protect their interests. Trappers are another group directly affected by logging operations, and we order MNR to help re-open the trails used in working traplines after harvest.

The intervenors believe that timber management planning has ignored analysis and valuation of the social and economic benefits of non-timber resources such as tourism, angling, hunting and other recreation and non-consumptive values such as wilderness. We agree. We were not persuaded that the tools are available today to do the sophisticated socio-economic analysis necessary to incorporate the cost and benefits of other forest values into timber management planning, but we are ordering MNR to develop these methodologies within two years.

We believe that all stakeholders and forest values must be afforded protection against the adverse impacts of timber operations. Our Conditions of Approval hold MNR responsible for doing so: the forest is no longer the sole preserve of timber extraction and the public will never allow a return to the past where the value of the forest was calculated only by its worth as logs and pulp and paper.

First Nations and Aboriginal Communities

The Aboriginal peoples of northern Ontario were prominent participants at the hearing and in Chapter 10 we discuss their concerns about timber management planning. Represented by counsel, they presented their own cases through witnesses who testified for them at locations including Kenora, Sioux Lookout, North Bay and Thunder Bay. The major intervenors were Grand Council Treaty #3, the Nishnawbe-Aski Nation and the Windigo Tribal Council, the Ontario Metis and Aboriginal Association and the North Shore Tribal Council, United Chiefs and Councils of Manitoulin and Union of Ontario Indians in partnership with the Northwatch Coalition.

Our decision concerning the interest of Aboriginal communities in Timber Management Planning consists of two findings and their associated Conditions of Approval. In the first we approve the Timber Management Native Consultation Program, which parallels the overall planning process but affords opportunities for First Nations and Aboriginal communities to get recognition of their unique concerns into Timber Management Planning. In our opinion, this program can offer the same protection for the values of native communities against the adverse impacts of timber operations that we are approving for other northern Ontario communities and interests.

The evidence we received on employment, poverty and access to off-reserve timber convinced us of the historical and present day exclusion of native communities from sharing in the social and economic benefits enjoyed by non-native communities from timber operations on Crown land. We do not have evidence in front of us to define how treaty and

Aboriginal rights affect the participation of Aboriginal peoples in Timber Management Planning, but from what we heard we think that until disputes about their rights and the responsibilities of governments are resolved, there will continue to be barriers to the stability and economic development of these communities.

Based on the evidence we received solely pertaining to the application before us, we order the Ministry of Natural Resources to undertake negotiations with First Nations and Aboriginal communities on the basis of initiatives MNR is already pursuing. These include the provision of employment opportunities in bush and mill operations near native communities and the provision of timber licenses where unalienated Crown timber exists close to Indian Reserves or where there are opportunities for third-party license negotiations with existing licensees.

The Future

Our decision means the forests will be managed differently than they have been up to now. Our approval establishes the direction for timber management planning on many subjects for which the technical and scientific information exists to make a decision today. On other matters the best we can do is to order MNR to do research and act on the results during the term of our approval. In Chapter 11 we discuss some of the initiatives and obligations we require of MNR to change its management direction in line with our approval.

A significant shift in management philosophy is under way at MNR with its commitment to move into forest management based on sustainability. Some of the intervenors argued the application before us should have been integrated forest management, not timber management, and that we should order MNR to implement forest management quickly. There appears to be a consensus in the forestry community that integrated forest management is the most suitable long-term approach, but realistically much work needs to be done on exploring its feasibility in Ontario before it can be fully implemented.

Although MNR is committed to integrated forest management, before its practice becomes a reality we need answers from the scientists. The first important question is sorting out the means of conserving or maintaining biological diversity. MNR agreed with the intervenors that the forest needs to be managed in a way that prevents the irreversible loss of its plants, animals and the variety of all living things in the forest ecosystems due to human activities such as timber management operations. Forests for Tomorrow proposed landscape management as the best approach to addressing biodiversity concerns, while the Ontario Federation of Anglers and Hunters/Northern Ontario Tourist Outfitters Association

Coalition argued that there were better ways of doing it. We are ordering MNR to continue the investigations it has already begun on both of these approaches within the context of managing for biodiversity. Everyone at the hearing agreed that two expensive technologies requiring long-term development are needed to support these new forest management approaches. We are, therefore, ordering MNR to pursue its work on developing these technologies: an Ecological Land Classification system and a Geographic Information System.

We require MNR to report to the public and the legislature on the results of all its investigations so that MNR cannot backtrack on its commitments or drag its heels in fulfilling its promises.

We cannot wait for the outcome of research and development and changes in management direction to address concerns about the protection of old growth. We are ordering MNR to treat old white and red pine stands as values to be protected in the Area of Concern process until a conservation strategy is developed within our imposed two-year deadline. This condition will be a strong incentive for foresters to defer cutting red and white pine stands that could receive stronger protection in the policy under development. We are allowing MNR more time to establish a provincial old growth policy for other species and ecosystems because they are much more plentiful than red and white pine.

We are also ordering MNR to add to its list of provincial featured species the pine marten and the pileated woodpecker. These two species require old growth habitat in the boreal and the Great Lakes-St. Lawrence forests. The evidence persuaded us that while the currently identified featured species – moose and deer – protect, to some extent, the habitat of 70% of wildlife in the Area of the Undertaking, the addition of species relying on old growth will extend habitat protection for some of the remaining 30%. We recognize the possibility that in the future landscape management or wildlife habitat supply approaches may prove to be better tools for wildlife management than featured species. Until then we are convinced of the necessity of maximizing the protection of wildlife habitat in timber management planning.

The Hearing Process

Our reflections on some of the problems that made this hearing so long and costly are found in Chapter 12. Here we also provide our recommendations for changing the environmental assessment process for the better, taking advantage of what was learned at this hearing.

The Decision

After the hearing ended, completing our deliberations and writing our reasons, as they appear in the following 12 chapters, took another year because of the huge amount of evidence and complexity of the questions before us. Everything we heard was considered and it influenced the decision, most directly by the daily notes we made in order to understand and analyze the evidence. To describe all the evidence and to refer to every submission in the reasons, however, was impossible.

The Conditions of Approval are discussed in the reasons and the full text is found at the end of the decision. This summary chapter is also being published separately for wider distribution. The full document is available in English from the Environmental Assessment Board. The Exhibit List is also available from the Board.

CHAPTER 1

INTRODUCTION

BEFORE THE HEARING

The Ministry of Natural Resources began work in the late 1970s to design a process for planning and conducting timber operations that could pass the test of approval under the *Environmental Assessment Act* (R.S.O. 1990 c. E.18). On December 23, 1985, MNR submitted the class environmental assessment for review and approval of the undertaking of timber management on 385,000 square kilometres of Crown Land. This territory, divided into what are now 90 management units, is shown on Map 1 at the end of this chapter. The original environmental assessment document, after several revisions, was amended in July 1987 and submitted as Exhibit 4 at this hearing. Shortly before making public the government review (Ex. 5) of the class environmental assessment in December 1987, the Minister of the Environment required the Environmental Assessment Board to hold a hearing under s. 12 (2) of the *Environmental Assessment Act*. This notice was issued to the Board in a note of referral dated October 14, 1987 (Ex. 1). The Environmental Assessment Board published its own notice of public hearing on March 8, 1988 (Ex. 3).

THE HEARING

The timber management class environmental assessment hearing took four and one half years, and concluded on November 12, 1992, in Sudbury. It was Ontario's longest environmental assessment hearing. We think it was too long and too expensive and we comment on the reasons for this in Chapter 12. We conducted preliminary hearings in January and February 1988. The main hearing began in Thunder Bay on May 10, 1988. It moved to Toronto in 1990. We decided to conduct a large part of the hearing in northern Ontario because of the direct interest of northern communities and the forest industry in timber management.

This hearing was attended by essentially five full-time intervenor groups. We also heard from many part-time intervenors, 19 of whom received full time correspondence. At the end of the decision (p. 535), we list the hundreds of witnesses appearing on behalf of the Ministry of Natural Resources and the intervenors and persons who spoke on their own behalf.

Full-time parties in attendance were:

- MNR;
- Ontario Forest Industry Association and Ontario Lumber Manufacturers Association (OFIA);
- Forests for Tomorrow (FFT) – (a Coalition of the Botany Conservation Group of the University of Toronto, the Federation of Ontario Naturalists, the Sierra Club of Ontario, the Temiskaming Environmental Action Committee and the Wildlands League);
- Ontario Federation of Anglers and Hunters (OFAH) and the Northern Ontario Tourist Outfitters Association (NOTOA), who joined forces later in the hearing (we refer to them as the Coalition); and
- Ministry of the Environment (now Ministry of Environment and Energy (MOEE)).

Attendance by other groups was more sporadic. Among them were groups representing First Nations and Aboriginal communities:

- Grand Council Treaty #3 (GCT #3);
- Nishnabe-Aski Nation and the Windigo Tribal Council (NAN/WTC); and
- Ontario Metis and Aboriginal Association (OMAA).

Other parties whose involvement was less than full-time included:

- Northwatch, representing twenty member groups in partnership with the Northshore Tribal Council, the United Chiefs and Councils of Manitoulin, and the Union of Ontario Indians;
- Northwestern Ontario Associated Chambers of Commerce (NOACC);
- Red Lake-Ear Falls Joint Municipal Committee;
- Ontario Professional Foresters Association (OPFA);
- Canadian Association of Single Industry Towns (CASIT);
- Canadian Paperworkers Union (CPU); and
- Beardmore-Lake Nipigon Watchdog Society.

COMMUNITY HEARINGS

For the purpose of hearing the views of all interested persons and groups, we held community hearings in Dryden, Fort Francis, Sault Ste. Marie, Espanola, Timmins, Hearst, Geraldton, Red Lake, Kenora, Sioux Lookout, Ottawa, New Liskeard, North Bay, Thunder Bay and Toronto. We also provided daily transcripts in libraries and government offices at 25 locations across Ontario so that the public could keep track of what was being said at the hearing.

The community hearings took on the character of town hall sessions. Speakers made presentations in an informal setting, and answered questions from others who were present. We never accepted the legalistic view that the formal "courtroom" atmosphere in which most of the hearing was conducted with the evidence of the major parties being directed and cross-examined by lawyers, was somehow more important than the community hearings. The public witnesses demonstrated to us that they understand the importance of the forest industry to Ontario, that they support a timber management planning process that will allow timber operations to proceed so long as the environment is being protected and that they have good ideas for improving MNR's proposed planning process. We look to the record of these hearings for guidance as we make findings concerning the "public interest." As a general finding, we believe that the voices and positions presented to us accurately represent the diversity of views held by the general public.

SITE VISITS

We took four site visits in each of the four seasons over large areas of northwestern, central and northeastern Ontario to see how timber management operates in the bush and to observe the enormous variety of forest conditions and how these differences influence timber management decisions on specific sites. We invited the parties at the hearing to suggest sites for us to view with the expectation that we would see the worst and the best examples of timber management practices. These site visits assisted us in understanding the evidence and submissions before us. Map 2 shows the locations we visited. What we saw helped us to understand that timber operations today appear to be managed more carefully, with a focus on protecting the environment, than was the case at least before the early 1980s. That timber operations are intrusive and change the natural conditions of the forest is undeniable, but we also observed, at least from what we saw, that our forest is not in a state of disaster nor did the effects of timber management appear to be irreparable or permanent.

THE RECORD

The hearing record represents the cumulative knowledge, opinions and wisdom of the most expert and authoritative people who have devoted their careers and lives to the task of understanding and managing Ontario's forests.

The record of the timber hearing grew to 70,000 pages of daily transcripts in 411 volumes, some 2300 exhibits and tens of thousands of pages of supporting material. This valuable library of information for students and practitioners is described in the list of exhibits. There is merit in maintaining this record for research and reference during the term of this approval. MNR will have to use the record when implementing the timber management planning undertaking and when improving and developing its efforts. MOEE also will require this resource in order to monitor compliance to this approval effectively. Also, members of the public must be able to use this record for research and reference purposes. A huge amount of public money has been invested in this record and it should not become a useless artifact or used only by the select authorities who govern this undertaking, so we are ordering Condition 115:

115. MNR shall provide copies of the recorded proceedings of the Timber Management Planning Class Environmental Assessment Hearing including transcripts, exhibits, final argument and where possible, interrogatories, to Lakehead University and the University of Toronto, for academic and research purposes. MNR shall also maintain a copy in its main office in Toronto. The Ministry of Environment and Energy shall maintain a copy in the Environmental Assessment Branch for public use and for its own use in monitoring compliance with this approval.

THE ADVERSARIAL PROCESS

The quasi-judicial procedures we followed at the hearing, particularly the involvement of legal counsel and cross-examination of witnesses, attempted to invite and then focus, challenge and test the evidence we heard. While we have grave concern about the complexity, expense and accessibility of the adversarial process we believe it has adequately tested and focused expert opinions and the kinds of esoteric evidence that was placed before us. Our comments and recommendations on the hearing process are in Chapter 12.

While the hearing was in progress, we ordered parallel efforts to forge consensus through negotiation among the parties. In 1988 we ordered the parties to submit the draft terms and conditions they would ask us to consider if we approved the application and to explore whether they could reach agreement on their draft conditions. An early attempt at negotiations was not fruitful, and in 1990 we insisted that the parties try again, preferably

with a mediator to guide the discussions. The parties brought an experienced facilitator, H. Ray Illing, into subsequent rounds of the negotiations. He described the challenge as "far more parties and a larger number of complex issues than are usually present in a negotiation setting" (Ex. 2031). Parties who participated were MNR, FFT, OFIA, OFAH/NOTOA, MOEE, GCT #3, NAN/Windigo, OMAA, OPFA and CASIT. Two parties involved in the negotiations, OMAA and GCT #3, were not parties to the agreement.

Many issues were sorted out in these negotiations. We believe parties with divergent ideas, positions and interests came to a better understanding of one another, if not always to agreement. The negotiations produced fewer unanimous agreements than we had hoped, but the exercise helped to narrow the issues in dispute and to identify outstanding differences. The final decision on all of the issues before us is our own. While we have been persuaded by the evidence to accept almost all of the agreed conditions, in some cases we have found it necessary to alter them.

The hearing process, however legalistic in its form, was aimed not at deciding narrow specific interests, but at providing Ontario with sound public policy choices over matters of great importance to all Ontarians and to the wider ecological and environmental sphere.

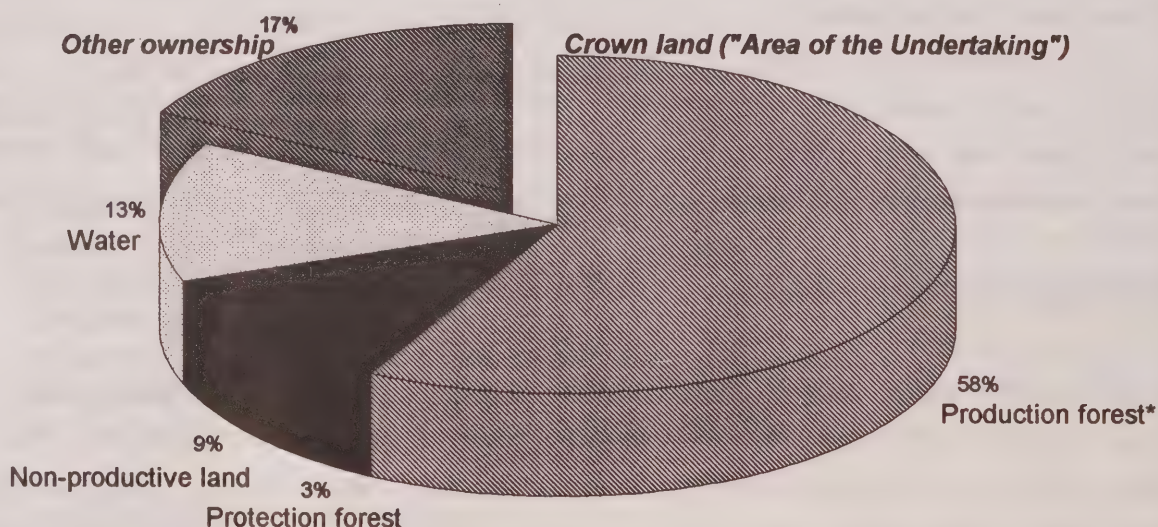
STATISTICAL SUMMARY

In the next few pages, we present a summary of statistical information, three maps of the Area of the Undertaking, a list of acronyms used in this report and a glossary. We hope these will be a useful reference guide for readers of our decision. One problem we experienced at the hearing was that we received huge amounts of information without the benefit of a brief statistical summary that would have given us an overview of the size, complexity and multiple interests of the forest environment and timber management planning. We put together this summary to provide such assistance to readers. The data are not intended to represent our findings; we acknowledge that the statistics may be outdated and incomplete and their definitions of terms and interpretation may be disputed. These statistics were submitted to us in evidence, and the sources for them in the hearing record are given on p. 29.

SIZE AND OWNERSHIP OF THE FOREST (in 1988)

	Area in square kilometres
Total area of Ontario	1,068,200,000
Total geographic area of the undertaking	465,000
<i>Crown land ("Area of the Undertaking")</i>	385,000
Production forest	269,000
Protection forest	14,000
Non-productive (forest and non-forest)	40,000
Water	62,000
Other ownership (private and federal, including Indian reserves)	80,000

Makeup of the Geographic Area of the Undertaking



*Timber management activities occur only on production forest lands owned by the Crown

Volume of Wood (Growing Stock)

	Volume in millions of cubic metres
Total volume of wood standing in Ontario	5,103
Total volume of wood on Crown land in the Area of the Undertaking	2,923
	Percentage

Total volume of wood in Ontario is made up largely of these species:

spruce	40%
jack pine	13%
poplar	20%
hard maple	8%
white birch	7%

BIOLOGICAL DIVERSITY

Forest Regions found in the Area of the Undertaking

	Principal Tree Species		Other Tree Species	
Boreal	white spruce black spruce balsam fir	jack pine trembling aspen white birch	tamarack white cedar red pine	white pine black ash
Great Lakes/ St. Lawrence	white pine red pine hemlock yellow birch sugar maple red maple red oak	basswood white elm	white cedar largetooth aspen beech white ash butternut white oak white spruce	black spruce balsam fir jack pine trembling aspen balsam poplar white birch

Water

Number of lakes

Lakes in Ontario	227,000
Lakes in the AOU	180,000
Lakes in the AOU smaller than 10 hectares (1978 count)	130,000

Wildlife

Number of species

Mammals in AOU	64
game animals	11

provincial moose population estimated at 94,100 (1991)
provincial deer population estimated at 250,000 (1988)
provincial caribou population estimated at 15,000 (1988)
provincial black bear population est. at 75,000 (1988)

fur-bearers (e.g. beaver, marten, otter and fisher)	22
Breeding birds in AOU	272
Reptiles in AOU	23
Amphibians in AOU	19
Fish in AOU	118
sport or commercial (e.g. lake trout, brook trout, northern pike, bass and muskellunge)	50

Rare, Vulnerable, Threatened and Endangered Species found, or which potentially could be found, in the AOU in 1992*

*COSEWIC list

	Rare	Vulnerable	Threatened	Endangered
plants	3	-	2	1
insects	1	-	-	-
reptiles	2	-	2	-
birds	8	-	2	6
mammals	3	-	-	1
fish	-	5	4	1

Plants

Vascular plants in Ontario	over 2,000
Vascular plants identified as rare native species* found in Ontario	542
Rare native species* found in the AOU	155
*in the Atlas of Rare Vascular Plants in Ontario	

FOREST ADMINISTRATION

MNR Professional and Technical Staff in the AOU (1992)

Planners	37
Biologists	129
Ecologists	15
Foresters	178
Native Liaison	21
Information Officers	24
Conservation Officers	165
Area Supervisors	98
Area Technicians	756
Total	1,423

MNR Regions

MNR has four Regions, of which three are entirely in the Area of the Undertaking: Northwest Region, Northeast Region and Central Region.
A small portion of the Southern Region is also in the AOU

MNR Districts in Ontario 29

Forest Management Units (1994)

There are 90 management units in the Area of the Undertaking:

Crown Management Units	47
Company Management Units	15
Forest Management Agreement Forests (FMAs)	28

In 1988, FMAs covered 177,293 ha, which is roughly 70% of the AOU under licence or 45% of all Crown Land in the AOU

Timber Licences (1988/89)

Timber licences issued under the Crown Timber Act	554
District cutting licences	7,138

Wildlife Management Units in Ontario 95

Provincial Parks in the AOU (1991)

Park Class	Number of parks	Area in hectares
Nature Reserve	60	75,930
Wilderness	5	1,201,710
Natural Environment	47	1,145,087
Waterway	25	479,849
Historical	2	1,844
Recreation	40	38,631
Total	179	2,943,051

Areas of Natural and Scientific Interest (1991)

ANSIs designated in the Area of the Undertaking	89
ANSIs under consideration within the AOU	102

FOREST USERS (Non-timber Interests)

Northern Residents

About 1.02 million people live in the Area of the Undertaking, and over half of them live in Thunder Bay, Sudbury, North Bay, Timmins and Sault Ste. Marie.

In 1986, out of 278 communities in Northern Ontario, 126 communities (representing 63% of the region's population) relied on forestry as a major economic activity with 2% to 40% of their labour force working in the forest industry.

Park Visitors

The number of park visits recorded (for only 66 of the 179 parks) in the Area of the Undertaking has remained relatively stable with 2.6 million visits recorded in 1985, compared to 3.06 million in 1990

Anglers

In 1985, 3.06 million anglers fished Ontario waters, and 75% of them were Ontario residents. Anglers spent an estimated \$981 million related to their sport in 1985 and caught an estimated 144 million fish.

Hunters

In 1987, there were 458,860 licensed hunters in Ontario, most of whom were Ontario residents, and they spent an estimated \$139 million.

Cottagers

In 1979, it was estimated that 62% of Ontario's 436,000 cottages were located in the Area of the Undertaking. Cottagers were estimated to account for \$784 million in the provincial annual recreational expenditures.

Trappers

	1986/87	1990/91
Registered trapping licences	17,239	11,636
Value of fur harvest	\$21.2 million	\$4.9 million

Tourist Operators

In 1987, it was estimated that there were about 2,700 tourism businesses in the Area of the Undertaking, of which 1,600 were fishing and hunting camps. In 1989, in the Area of the Undertaking, direct tourism expenditures were estimated to be about \$1.4 billion, which was estimated to have generated about \$830 million of direct and indirect income and direct and indirect employment of 23,350 person years, which likely means that roughly double that number of persons were employed for roughly half of the year.

DISTURBANCE - NATURAL AND HARVEST

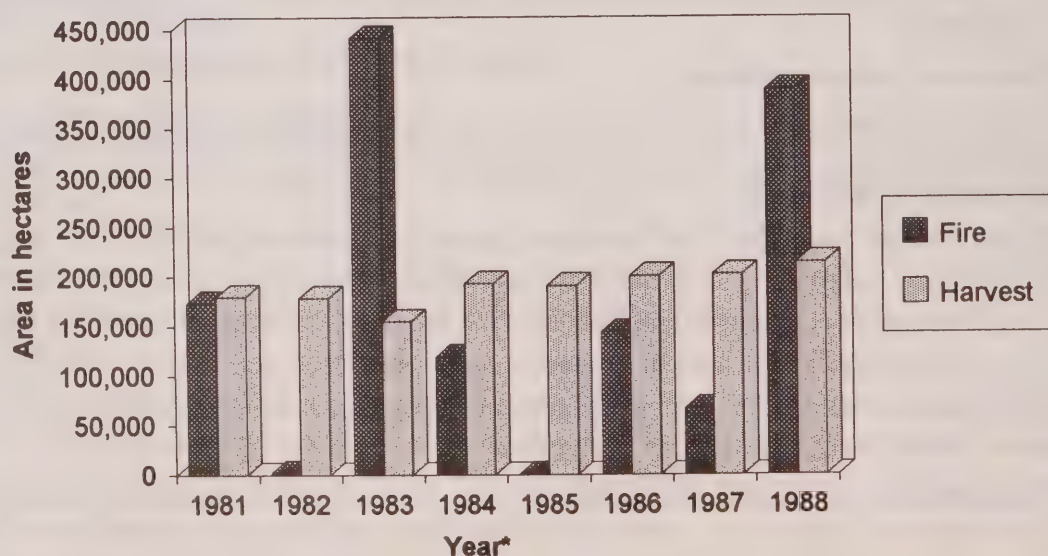
Average Annual Depletion in Ontario (1977-1981)

	Volume in cubic metres			
	Spruce	Balsam	Poplar	All species
Insects	3,159,000	10,093,000	155,000	15,493,000
Diseases	N/A	N/A	6,184,000	31,273,000
Harvest	7,977,000	628,000	1,243,000	16,978,000

Area Harvested and Area Burned by Wildfire on Crown Land (1981-1988)

Year*	Area in hectares	
	Fire	Harvest
1981	173,473	179,523
1982	2,555	178,191
1983	442,163	155,007
1984	118,853	192,468
1985	682	190,306
1986	143,692	200,199
1987	66,248	201,869
1988	388,868	213,847
Total (1981-1988)	1,336,534	1,511,410
Average annual (1981-1988)	167,067	188,926

* Fire statistics given for calendar year; harvest statistics for year ending Mar. 31



TIMBER OPERATIONS

Area in hectares Percentage

Harvest on Crown Land in Ontario (1990/91)

	Stumpage value	Volume in cubic metres		
Clearcut			155,881	89%
Shelterwood method			7,434	4%
Selection method			11,592	7%
Total harvest	\$68.6 million	17,758,392	174,907	100%

Site preparation on Crown Land in Ontario (1990/91)

Mechanical	92,854	82%
Chemical herbicides	14,176	13%
Prescribed burn	6,166	5%
Total site preparation	113,196	100%

Regeneration treatments on Crown Land in Ontario (1990/91)

Planting	71,187	73%
Seeding	26,189	27%
Total artificial regeneration	97,376	100%

Tending treatments on Crown Land in AOU (1990/91)

Aerial chemical cleaning (herbicide spraying)	87,869	79%
Thinning, improvement, pruning & other	15,854	14%
Manual cleaning	5,782	5%
Ground chemical cleaning (with herbicides)	2,056	2%
Total tending treatments	111,561	100%

Pesticide use for forestry in Ontario

<i>Herbicides (1990/91)</i>	Hectares treated		Total	Percentage
	Site Prep	Tending		
2,4-D	3,779	13,736	17,515	16%
Glyphosate	9,040	76,573	85,613	80%
Hexazinone, Simazine and others	419	3,268	3,687	3%
Total herbicide use	13,238	93,577	106,815	100%
Percentage	12%	88%	100%	

<i>Insecticides*</i>	Hectares treated		Percentage	
	(aerial application)	Biological (Bt.)	Chemical	
1984	3,697	84%	16%	
1985	250,380	100%	0%	
1986	735,759	100%	0%	
1987	222,531	100%	0%	
1988	27,807	100%	0%	

**note data not available for 1990/91; data not available for ground application*

FOREST INDUSTRY

Size

The forest industry has three sectors: primary forestry industries such as logging; the wood industries such as sawmills and waferboard; and the paper and allied industries such as pulp and paper mills and specialty papers.

Mill Licences	1984	1986	1988
Pulp and Paper Mills	20	20	20
Saw Mills	771	762	622
Veneer and Panelboard Mills	28	26	23
Total	819	808	665

Employment

Direct and Indirect Employment Related to the Ontario Forest Products Industry (1989)

Sector	Direct Jobs	Indirect Jobs Stimulated
Logging	7,756	6,957
Wood Industries	30,655	34,763
Paper & Allied Industries	42,333	58,885
Total/Overall	80,744	100,605

Regional Breakdown of Forest Industry Employment

Sector	Southern Ontario	Northern Ontario
Logging (1982)	4%	96%
Wood Industries (1983)	62%	38%
Paper & Allied Industries (1983)	66%	34%

Average Annual Incomes (1985)

	Salary Range
Forestry Industry Workers	\$22,356 - 31,599
Tourism & Related Occupations	\$14,000 - 16,000

Economic Importance

Forest Industry's Contribution to Ontario's Economy (1989)

Sector	\$
Logging	525,000,000
Wood Industries	1,318,000,000
Paper & Allied Industries	3,702,000,000
Total	5,545,000,000



SOURCES USED TO COMPILE STATISTICAL SUMMARY

Size and Ownership

Size and ownership of the forest (Ex. 209, pp. 45-50)

Volume of wood: in Ontario (Ex. 56); on Crown land in the AOU (Update, MNR Q. 7)

Biological Diversity

Forest regions and tree species in the AOU (Ex. 4, p. 53)

Water (Ex. 266B, pp. 517, 542)

Wildlife (Ex. 209, pp. 62-71; Ex. 2148; trans: vol. 84, p. 14124)

Rare & endangered species (Board Interrogatory 11; Update of Ex. 266A, MNR Q. 22)

Plants (Ex. 209, p. 62; Ex. 233)

Forest Administration

MNR staff in the AOU (Update of Ex. 376, p. 88, MNR Q. 23)

MNR Regions and Districts (Ex. 2309)

Forest Management Units (MNR March 1994)

Percentage of AOU in FMAs (trans: vols. 33, 103)

Timber licences (Ex. 1688, p. 19)

Wildlife Management Units in Ontario (Ex. 209, p. 67)

Provincial Parks in the AOU (Board Interrogatory 118)

Areas of Natural and Scientific Interest (Board Interrogatory 12)

Forest Users

Northern residents (Ex. 209, p. 75)

Park visitors (Board Interrogatory 118)

Anglers (Ex. 209, p. 117)

Hunters (Ex. 209, pp. 123-126)

Cottagers (Ex. 209, p. 127)

Trappers (Board Interrogatory 173)

Tourist operators (Board Interrogatory 172; Ex. 209, p. 112)

Disturbance

Average annual depletion by insects/diseases (Ex. 604A, p. 123); harvest (Ex. 604A, p. 131)

Area harvested on Crown Land (Update of Ex. 534C, MNR Q. 35 - Adjusted to show harvest in year of operations rather than in the following year as reported by MNR)

Area of Crown Land burned by wildfire (Ex. 1688, p. 77)

Harvest on Crown Land in Ontario (Update of Ex. 416A, p. 89, MNR Q. 25)

Site preparation on Crown Land in Ontario (Update of Ex. 532A, p. 322, MNR Q. 31)

Artificial regeneration treatments (Update of Ex. 532A, p. 150, MNR Q. 36)

Tending treatments on Crown Land in AOU (Update of Ex. 603A, p. 228, MNR Q. 36)

Pesticides: herbicides (Update of Ex. 604A, p. 228, MNR Q. 37); insecticides (Ex. 634)

Forest Industry

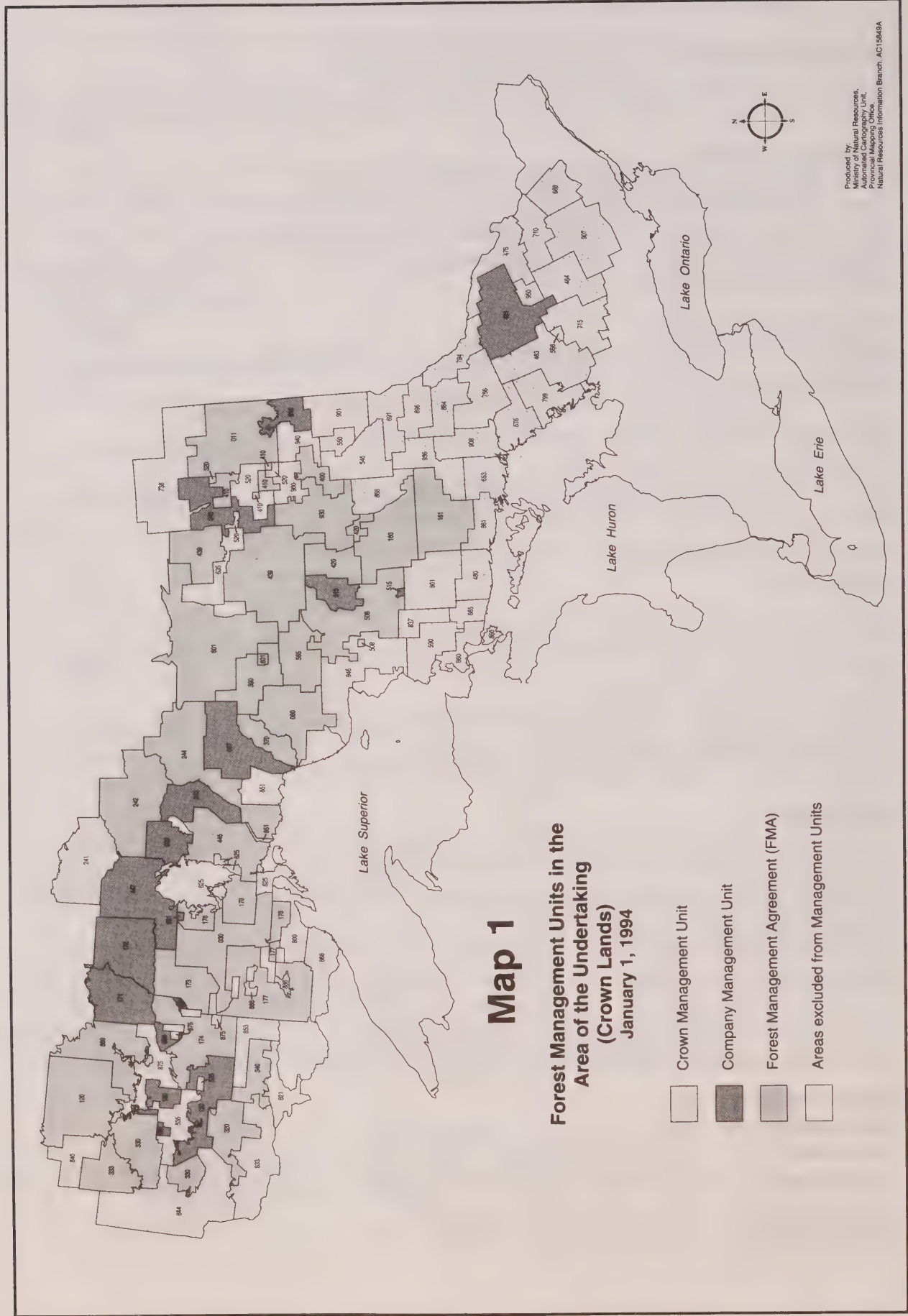
Mill licences (Ex. 1688, p. 19)

Direct and indirect employment (Update of Ex. 191, p. 65, MNR Q. 12)

Employment: logging (Ex. 191, p. 130); wood industries, paper & allied (Ex. 191, p. 122)

Average annual incomes (trans: vol. 184, p. 32292)

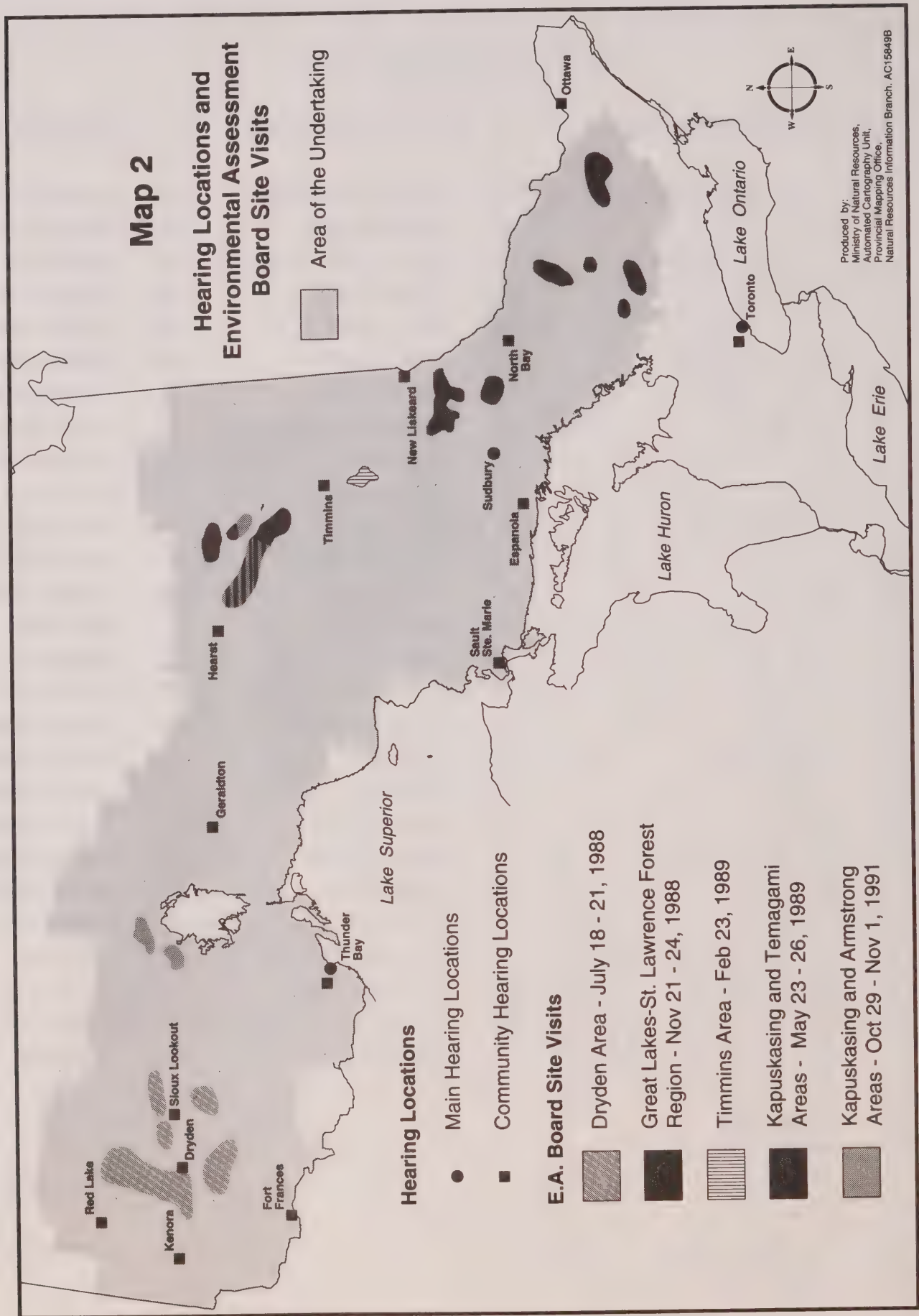
Forest industry's economic importance (Update of Ex. 191, p. 50, MNR Q. 10)

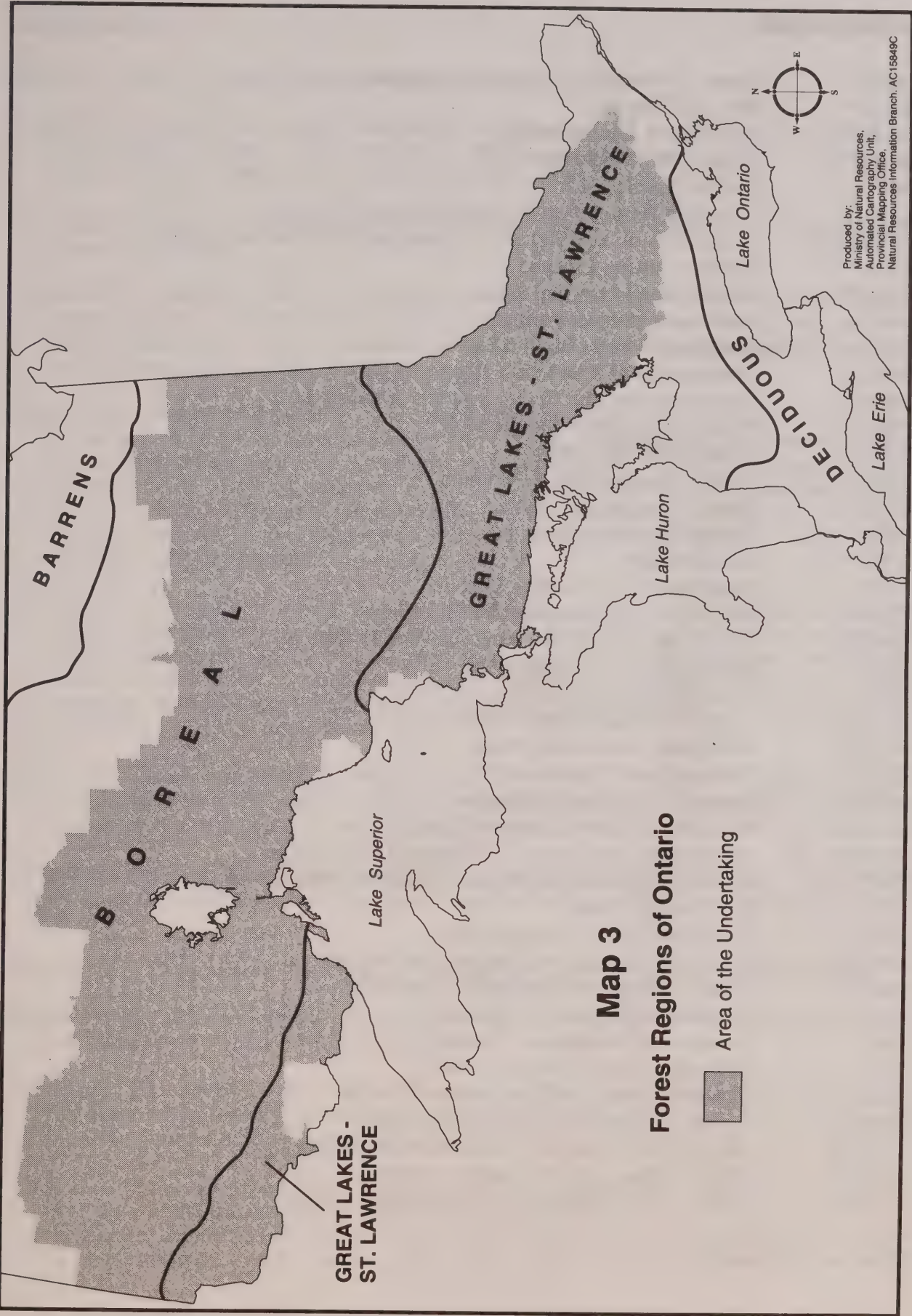


KEY TO FOREST MANAGEMENT UNITS

January 1, 1994

MNR NORTHWEST REGION		MNR NORTHEAST REGION		MNR CENTRAL REGION	
020	Auden Company	010	Iroquois Falls South Company	161	Lower Spanish Forest
030	Spruce River Forest	011	Iroquois Falls Forest	451	Algonquin Park Company
050	Abitibi Sioux Lookout Company	040	Smooth Rock Falls Company	464	Bancroft Crown
120	Trout Lake Forest	060	White River Forest	476	Bonnechere Crown
130	Wabigoon Company	067	Big Pic Company	480	Blind River Crown
171	Caribou West Company	160	Upper Spanish Forest	483	Bracebridge Crown
172	Caribou East Company	370	Black River Forest	566	Frost Centre Crown
173	Brightsands Forest	390	Nagagami Forest	576	Georgian Bay Crown
174	English River Forest	400	Timmins Forest	590	Goulais-Batchawana Crown
177	Dog River-Matawin Forest	410	Driftwood Forest	653	Killarney Crown
178	Black Sturgeon Forest	420	Pineland Forest	665	Kirkwood Crown
241	Ogoki Company	439	Gordon Cosens Forest	691	Latchford Crown
242	Nakina Forest	508	Superior Forest	710	Madawaska Crown
243	Geraldton Company	515	J.E. Martel Company	715	Minden Crown
244	Longlac Forest	520	Cochrane Crown	756	Nipissing Crown
320	Manitou Forest	545	Elk Lake Crown	784	Ottawa River Crown
330	Patricia Forest	550	W.L. Plonski Crown	799	Parry Sound Crown
333	Pakwash Forest	565	Magpie Forest	801	Peshu Lake Crown
340	Seine River Forest	601	Hearst Forest	837	Ranger Lake Crown
445	Lake Nipigon Forest	635	Kapuskasing Crown	860	Sault Ste. Marie Crown
447	Domtar-Armstrong Company	738	Moose River Crown	881	Spanish River Crown
535	Dryden Crown	868	Shiningtree Crown	884	Sturgeon River Crown
625	Nipigon Crown	900	Timmins Crown	896	Temagami Crown
644	Kenora Crown	901	Timiskaming Crown	907	Tweed Crown
651	Kiashke Company	930	Romeo Malette Forest	908	Trout Lake Crown
800	Port Arthur Crown	940	Watabeag Crown	936	Wanapitei Crown
821	Flanders Crown	946	Wawa Crown	950	Whitney Crown
833	Fort Frances Crown				
840	Red Lake Crown				
851	Steel River Crown				
853	Sapawe Crown				
869	Lac Seul Forest				
875	Sioux Lookout Crown			688	Lanark Crown
888	Thunder Bay Crown				
					MNR SOUTHERN REGION





ACRONYMS:

ANSI*	Areas of Natural and Scientific Interest
AOC*	Area of Concern
AOU*	Area of the Undertaking
AWS*	Annual Work Schedule
Bt*	<i>Bacillus thuringiensis</i>
CASIT	Canadian Association of Single Industry Towns
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DCL*	District Cutting Licence
DLUG	District Land Use Guideline
EA	Environmental Assessment
ELC	Ecological Land Classification
EPA	Environmental Protection Agency (U.S.)
ESSA	Environmental and Social Systems Analysts Ltd.
FEC	Forest Ecosystem Classification
FFT	Forests For Tomorrow
FMA*	Forest Management Agreement
FMU*	Forest Management Unit
FRI*	Forest Resources Inventory
FTG*	Free-to-Grow
GIS*	Geographic Information System
IFDP	Indian Forestry Development Program
INRIS	Integrated Natural Resources Inventory System
IPM	Integrated Pest Management
LCC	Local Citizens Committee
LTSY	Long Term Sustainable Yield
MAD*	Maximum Annual Depletion
MAI	Mean Annual Increment
MNR	Ministry of Natural Resources
MOEE	Ministry of Environment and Energy
NAN/WTC	Nishnawbe-Aski Nation / Windigo Tribal Council
NOTOA	Northern Ontario Tourist and Outfitters Association
NPV	Net Present Value
NSR	Not Satisfactorily Regenerated
OFAH	Ontario Federation of Anglers and Hunters
OMAA	Ontario Metis and Aboriginal Association
RPF	Registered Professional Forester
SAS	Silvicultural Assessment System
SIS	Silvicultural Information System
SLUP	Strategic Land Use Plan
SOARS	Survey of Artificially Regenerated Sites
STEMS	Silvicultural Treatment Effectiveness Monitoring
TMPM	Timber Management Planning Manual
VMAP	Vegetation Management Alternatives Program

*Defined in Glossary

GLOSSARY:

Words in **bold** are defined in the glossary.

Age Class: One of the intervals into which the age range of forest **stands** is divided for classification and use. For its inventory, MNR uses age class groupings of barren & scattered, 1-20, 21-40, 41-60, 61-80, 81-100, 101-120, 121 + years.

Age Class Distribution: The location and/or proportionate representation of different **age classes** in a forest.

Annual Work Schedule (AWS): A statement, mainly tabular in form, showing the order and extent of all work of any nature to be carried out during one year, consistent with the **Timber Management Plan**. It includes all information on **harvesting, regeneration, and maintenance** for one year.

Area of the Undertaking (AOU): The area within the geographic boundaries of the area of the undertaking is all land and water within **Forest Management Unit** boundary lines. The northern boundary is generally the northern limit of current commercial timber operations; the southern boundary is generally the limit of the forest on **Crown land**. Of that area, 385,000 square kilometres (or 38.5 million hectares) is Crown land subject to the undertaking, and is referred to as the "Area of the Undertaking" in this Decision. See Maps and the statistical summary.

Area of Concern (AOC): An area of **value** to other users/uses which may be affected by timber management activities. These areas require modifications to those operations usually prescribed. AOCs include such features as wildlife habitats, rare vegetation, tourism consideration, streams, canoe routes, railways, trout lakes/fisheries, other lakes, campsites, portages, park boundaries, residences, lodges, cottages, deer yards, public roads, osprey nesting sites, heronries.

Areas of Natural and Scientific Interest (ANSI): ANSIs are areas of land and water containing natural landscapes or features which have been identified by MNR as having **values** related to protection, natural heritage appreciation, scientific study or education.

Bacillus thuringiensis (B.t.): A biological insecticide registered under the federal *Pest Control Products Act*, B.t. is a bacterium used to control insects which become butterflies and moths.

Blowdown: Uprooting or flattening of trees, either singly or in large tracts, by wind.

Boreal Forest: A broad band of mixed coniferous and deciduous trees that stretches across northern North America, Europe and Asia.

Bump-up: The elevation of a **Timber Management Plan**, or a component part of it, from the **class environmental assessment** to an individual assessment status. Anyone can request a bump-up. The acceptance of a bump-up is subject to approval by the MOEE.

Class Environmental Assessment: Means, when used in relation to a class of **undertakings** is an **environmental assessment** submitted pursuant to subsection 5(1) and section 40 of the *Environmental Assessment Act*. A class of undertakings may be defined with respect to any attribute, quality or characteristic. Subject to the Class Environmental

Assessment approval, the undertakings comprising the class are no longer subject to the requirement of specific approval under the act.

Cleaning: Cleaning treatments (also known as "release treatments") are **tending** treatments which are carried out in very young **stands** to release the desired **regeneration** from competing vegetation. In Ontario, chemical cleaning by aerial spraying of herbicides is the most common tending treatment, used most often to release jack pine or spruce seedlings from competing broad-leaved plants in the **boreal forest**. Chemical cleaning treatments can also be carried out by ground application. Manual cleaning treatments are accomplished by hand or by mechanical means.

Clearcut: The logging of an entire forested area at one time, with or without leaving **seed trees** and unmerchantable trees standing.

Clearcut System: An **even-aged silvicultural system** where the entire growth is **harvested** in one operation, with or without leaving **seed trees**. The rationale is that, to replace the forest with another in which all the trees are again the same age, they should be cut at the same time.

Company Management Units: There are 15 Company Management Units in the **Area of the Undertaking**, licensed to large forest companies which play a greater role in timber management. The large companies have professional foresters on staff and are able to carry out the planning as well as some timber management operations. Planning, provision of access and **harvest** operations are all carried out by the companies; however, the Ministry will normally carry out the activities of **renewal** and **maintenance** (or contract these functions to individuals or companies)

Conifers: Needle-bearing trees that produce seeds in cones.

Contiguous Cuts: Term used to describe **clearcuts** that are adjoining or close together.

Coupe: A single cut in which all or virtually all of the trees are removed from a stand in one operation. **Strip cuts** and **shelterwood** cuts use a series or progression of cuts, which can be described as two-, three- or four- coupe systems.

Crown Land: Land in Ontario that is public land under the jurisdiction of the provincial government, including land under water.

Crown Management Units: There are 47 Crown Management Units in the **Area of the Undertaking** where the MNR prepares **Timber Management Plans** and may carry out timber management operations itself. The Ministry may also contract operations to individuals or companies or issue short-term licences (up to five years) to companies which then carry out operations according to the approved plan prepared by MNR.

District Cutting Licence (DCL): Is a form of granting tenure or authority to **harvest** timber through licence from the Crown. DCLs are generally for the purpose of providing local residents with rights to Crown timber for personal use, such as fuelwood, or for small scale commercial operations. District Cutting Licences are granted under subsection 2(7) of the *Crown Timber Act* (R.S.O. 1990, c.C.51), with delegated authority by the District Manager, and are limited to an area of 160 acres (65 hectares). The area devoted to District Cutting Licences represents a small portion of the productive land base, but the number of such licences is large and many are issued for fuelwood purposes.

Disturbance Forest: Where fire, insect infestation and **blowdown** have created large openings in the forest, which regenerated into large, **even-age stands**.

Environment: Defined in section 1 of the *Environmental Assessment Act* to include air, land, water, plant and animal life, including humans, the social, economic and cultural conditions and the influence the life of humans or a community, any building, structure, machine or device, and any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting from human activities or any part of combination of the foregoing and the interrelationships between any two or more of them.

Epidemic: A very great expansion of the normal insect population to cover large areas with sufficient density to cause significant damage and tree mortality.

Even-Aged: Applies to **stands** or forests in which relatively small age differences exist between individual trees. The maximum difference in age is usually twenty years.

Fauna: Animal population of a particular area; generic term for, or relating to, animals.

Flora: All of the plants present in a given region (includes bacteria and fungi); generic term for, or relating to, plants.

Forest Management Agreement (FMA): An agreement pursuant to s. 6 of the *Crown Timber Act*. There are 28 FMAs in the **Area of the Undertaking**. Forest Management Agreement Forests are similar to **Company Management Units**, in that these management units are licensed to large companies. The major difference is that the companies have agreed, through negotiated agreements, beginning in 1980, with the Minister of Natural Resources, to carry out the planning, and all operational aspects of timber management, except **protection** operations (i.e. insect and disease pest control).

Forest Management Unit (FMU): A forest area administered, controlled and operated under one management plan. In Ontario there are three types of management units: **Crown management units**, formed to permit sustained yield operations from unlicensed **Crown lands** and aggregates of small licensed areas; **company management units**, where sufficient areas of Crown timber for sustained-yield operation have been licensed to one company; and **Forest Management Agreement (FMA)** forests. See Map 1.

Forest Resource Inventory (FRI): A resource inventory conducted for each **Forest Management Unit** on average every twenty years. The FRI divides the area into a number of components, such as water, non-forested, non-productive forest, and **productive forest**; and further classifies each component by ownership/land use categories. The FRI provides descriptive information about the timber resource on each management unit in the form of interpreted aerial photographs, forest **stand** maps and a set of standard inventory ledgers referred to as reports.

Forestry: A profession embracing the science, business, and art of creating, conserving, and managing forests and forest lands for the continuing use of their resources, material, or other forest products.

Free-to-Grow (FTG): **Stands** that meet **stocking**, height, and/or height growth rate and are judged to be essentially free from competing vegetation.

Full-tree Logging: A method in which felled trees are moved in small bunches to the roadside, where trunks and tops are removed.

- General Standard Site Types:** A coding or labelling system in the silvicultural guide to allow for referencing of site description information on similar sites across the province.
- Geographic Information System (GIS):** A system which organizes geographic data in ways that allow powerful computers to be helpful in storing, updating, comparing and presenting the information.
- Ground Rules:** Provide specifications, standards, and other instructions (mostly silvicultural) to direct management on **Forest Management Unit** areas for a term concurrent with the operating period of the **Timber Management Plan**.
- Growing Stock:** All the trees growing in a forest or in a specified part of it, generally expressed in terms of number or **volume**.
- Harvesting:** Cutting and moving the trees, sometimes also including initial processing and extraction.
- Hectare:** One hectare is 10,000 square metres or 2.5 acres.
- Independent Audit:** Audit of the timber management program on a Forest Management Unit by a non-government team, pursuant to Condition 86 of this approval.
- Landings:** Cleared areas where roundwood is concentrated for further transport or processing. These areas are created at roadside, or adjacent to rights-of-way.
- Maintenance:** Maintenance operations include two activities: **tending** and **protection**. Maintenance operations are carried out to ensure the survival and development to **maturity** of the established forest crop.
- Maturity:** The stage at which a tree, crop, or **stand** best fulfils the purpose for which it was maintained. In most cases, this means ready for **harvest**.
- Manual Tending Techniques:** Manual tending techniques are different methods used to effect a **tending** treatment, and include brush cutting, girdling, felling, herbicide injection, **thinning** and **pruning**.
- Maximum Allowable Depletion (MAD):** The calculated amount of area from which timber may be depleted over the five-year term of a **Timber Management Plan** by any means, including **harvesting**, fire, insects, disease, inoperability, or because of the **allocation** of the area to other uses to fulfil the objectives of management.
- Merchantable Timber:** Refers to commercially valuable or saleable timber.
- Mixed-wood Stand:** A **stand** made up of a mixture of hardwood and softwood tree species.
- Modified Operations:** Areas where normal operations must be modified to provide for protection of the identified **value (area of concern)**.
- Normal Forest:** MNR described the requirements of a perfectly normal (or "regulated") forest: land with equally-productive areas of each **age class**; normal **growing stock** on each of these areas of each age class; all **volume** at **rotation age** is depleted; all age classes grow equally and are successfully regenerated; only cutting depletes the forest; and the land base is constant.

Normal Operations: Referring to normal timber operations as identified in the *Silvicultural Ground Rules*. Each commercially important tree species has been assigned a cutting method such as **clearcutting** for poplar, white birch, and jack pine; **shelterwood cut** for white pine; and selection cuts for hard maple. Normal cuts are modified or changed for other **values**.

Nursery Stock: Tree seedlings produced in nurseries for provincial planting programs.

Nutrient Depletion: **Harvest**, particularly **full-tree logging**, where the branches and foliage of the entire tree are removed from the harvest area, may result in lower levels of nutrients necessary for plant growth, and may affect long-term **site productivity**.

Order-in-Council Licence: Granted by the Minister of Natural Resources under the authority of subsection 3 (1) of the *Crown Timber Act* subject to the approval of the Lieutenant-Governor-in-Council. There is no legislative limit prescribed for the size and period of these licences, but they are generally limited to periods of twenty-one years for larger licence areas (up to approximately 6,000 square kilometres) and five years for smaller licensed areas ranging approximately from 1 to 2,000 square kilometres. There are up to 400 of these licences in effect in any one year. Order-In-Council Licences have been the principal vehicle for authorizing the disposition of timber between 1920 and the early-1980s. In 1980, more than 90% of the area devoted to timber production in Ontario was licensed under such authorization. This proportion has been decreasing, however, since the introduction of **Forest Management Agreements (FMAs)** in 1979, which now cover roughly 70% of the **AOU** under licence.

Overmature: Timber in an **age-class** older than its **rotation age**.

Pesticide: Any chemical or biological agent that kills, controls, or modifies the behaviour of an unwanted plant or animal. Herbicides are used to kill weeds, shrubs, small trees or grasses. Insecticides are used to kill insect pests.

Plan: See **Timber Management Plan**.

Prescribed Burn: Prescribed burning is the application of fire to forest fuels in a well-planned manner, under a pre-determined set of weather and fuel conditions, to accomplish defined resource management objectives. The major use of prescribed fire in Ontario is as a **site preparation** technique, either after logging or damage from insects and disease.

Production Forest: Productive forested land, at various stages of growth, with no obvious physical limitations on the ability to practice timber management.

Productive Forest: In the **Forest Resources Inventory**, the forested portion of Crown land area of a management unit is classified as either "non-productive forested land" or "productive forested land." Productive forested land can be described as all forest areas which are capable of growing trees for commercial purposes, and is further sub-divided into "**protection forest**" and "**production forest**."

Proponent: As defined in the *Environmental Assessment Act*, is a person who,
(a) carries out or proposes to carry out an undertaking, or
(b) is the owner or person having charge, management or control of an undertaking.
In this application, the proponent is the Ministry of Natural Resources.

Protection: The branch of forestry concerned with the prevention and control of damage to forest arising from fire, insects, pathogens, storm, frost, and other climatic agencies, and also from the action of man. Protection of the forest from insects and disease can involve the use of insecticides in insect pest management programs.

Protection Forest: Productive forested lands on which timber management activities cannot normally be practised without incurring deleterious environmental effects, because of obvious physical limitations such as steep slopes and shallow soils over bedrock.

Regeneration: The renewal of a tree crop whether by natural (self-sown or by vegetation means) or artificial means (seeding and planting). This term may also be used to describe the young crop itself.

Release Treatment: See **Cleaning**.

Renewal: See **Regeneration**.

Reserves: Sometimes also referred to as "buffers," reserves are areas where **harvest** is modified or prohibited to protect other **values**.

Return Cut: Harvest of trees left standing after a previous cut.

Rotation Age: The optimum age to which a tree should be grown. The period of years required to grow a **stand** to a specified condition, economic and natural **maturity**.

Salvage Cut: The removal of trees killed or injured by fire, insects, fungi, or other harmful agencies for the purpose of using **merchantable timber** before it becomes commercially worthless.

Scarification: Mechanical loosening of the topsoil of open areas, or breaking up the forest floor, in preparation for **regeneration** by natural seeding.

Sedimentation: The deposition of organic materials or minerals by chemical, physical or biological processes.

Seed Cut: A harvesting operation where an area is clearcut save for a small number of seed-bearing trees left singly or in small groups.

Shade Tolerance: Shade tolerance is a silvical characteristic of trees, which refers to the ability of the tree to survive at low light levels. Shade tolerant species such as black spruce can grow within the understorey of a **stand**; shade intolerant species such as jack pine require full sunlight to grow.

Shelterwood System: An **even-aged silvicultural system** where **mature** trees are **harvested** in a series of two or more cuts, or **coupes**, (preparatory, seed, removal, final) for the purpose of obtaining natural **regeneration** under shelter of the residual trees, whether by cutting uniformly over the entire **stand** area or in narrow strips. Regeneration is natural. Regeneration interval determines the degree of even-aged uniformity.

Short-wood Logging: Method in which trees are felled and cut to desired lengths at the stump. This method is declining as companies move to greater mechanization.

Silviculture: The science and art of cultivating forest crops. More particularly, the theory and practice of controlling the establishment, composition, constitution, and growth of forests. Silviculture is a combination of three forestry activities; 1) timber **harvest**, 2) forest **renewal**, 3) subsequent **maintenance** of new forest.

Silvicultural System: A process, following accepted silvicultural principles, in which crops constituting forests are **tended**, **harvested**, and **regenerated**, resulting in the production of crops of distinctive form. Systems are conveniently classified according to the method of harvesting the **mature stands** with a view to regeneration and according to the type of crop produced.

Silvicultural Treatment: The activities, whether biological or managerial, through which a silvicultural prescription is met.

Site: An area considered in terms of environment, particularly as this determines the type and quality of the vegetation the area can carry.

Site-Class: A measure of the relative production capacity of a site for a particular species. The average height at a given age is generally the basis for classification.

Site Preparation: Disturbance of the forest floor and the topsoil to create suitable conditions for natural or artificial **regeneration** by mechanical or chemical means, or by **prescribed burning**.

Site Productivity: Refers to the capability of a forest area to produce timber over time, and is usually measured as "yield." The effects of logging on soil nutrient supplies and processes may alter site productivity.

Slash: Tree tops and branches left on a **harvest** site after merchantable logs have been hauled away.

Snags: Standing or partially fallen dead trees that may serve as a source of food and/or habitat for wildlife.

Soil Compaction: The compression of soil as a result of vehicle traffic, especially that of heavy equipment.

Stand: A community of trees possessing sufficient uniformity in composition, constitution, age, arrangement, or condition to be distinguished from adjacent communities, so forming a silvicultural or management entity.

Stocking: An expression of the adequacy of tree cover on an area.

Strip Cut: A clearcut **harvest** operation where the cut areas are strips or blocks at least 40 metres wide.

Stumpage Charges: The amount equal to the total of the amount of the Crown dues and any other amounts added in fixing the price to be paid for Crown Timber.

Suckering: Resprouting from stumps or roots of woody species following cutting of the above ground portion of the plant.

Tree Length Logging: A method in which, after trees are felled, the branches and tops are cut off and the tree is dragged to the roadside for further transport or roadside processing.

Tending: Operations carried out to encourage survival and growth of desirable trees, undertaken by removing undesirable or competing vegetation. Tending includes the use of herbicides. Tending treatments include **cleaning, thinning**, pruning, improvement cuts and **salvage cuts**.

Thinning: A **tending** operation where a cut is made in a **stand**, usually past the sapling stage, for the purpose of stimulating the growth and improving the quality of remaining trees.

Timber Management Plan: A document which must be prepared for each management unit every five years, in accordance with the requirements of this approval and the **Crown Timber Act**, which sets out planned Timber Management activities. It is prepared for a twenty year period, but provides details of operations to be undertaken during the initial five-year term.

Undertaking: Defined in section 1 of the *Environmental Assessment Act* as any enterprise, activity, proposal, plan or program by a public body (provincial or municipal), and a major commercial or business enterprise or activity, or its proposal, plan or program, which is designated by regulations. See **Class Environmental Assessment** for an explanation of a class of undertakings as used in this decision.

Uneven-Aged: **Stands** or forests in which trees markedly differ in age.

Values: Specific geographical areas that would be of interest from various points of view; something which may have to be protected as a result of timber management activities.

Volume: The amount of wood in a tree, **stand**, or other specified area, according to some unit of measurement or some standard of use. Unit of measure is usually cubic metres.

Working Group: An inventory aggregation for management purposes. An aggregate of **stands**, including potential forest areas assigned to this category, having the same predominant species, and management under the same rotation and broad **silvicultural system**.

Yield: The **harvest**, actual or estimated, over a given period of time.

CHAPTER 2

THE REQUIREMENTS OF THE ENVIRONMENTAL ASSESSMENT ACT AND TIMBER MANAGEMENT PLANNING

INTRODUCTION

In this chapter we discuss the specific findings required of us by the *Environmental Assessment Act* in our decision whether to accept the class environmental assessment, whether to approve the timber management planning undertaking and, if approval is granted, what conditions, if any, should be imposed. We try to write our findings in clear language, as we do everywhere in our decision, because we want everyone who is interested and affected by timber management to understand our reasoning, not only the lawyers.

This was the first Class EA to be the subject of a hearing before the Environmental Assessment Board. The parties raised many legal and procedural issues but we discuss only those we believe are relevant to our decision and our responsibilities under the *Environmental Assessment Act*. These findings include questions of law (i.e., interpreting the meaning of a statutory provision) and questions of fact (i.e., arriving at conclusions about facts based upon the evidence before us).

The discussion will follow the order of the provisions of the *Environmental Assessment Act*, particularly s. 5(3). We discuss the guidance we took from the purpose section of the *Environmental Assessment Act*, and we discuss the factors that make this Class EA different from individual EA applications.

We describe in detail our consideration of whether the Class EA generally satisfies the requirements of s. 5(3) of the *Environmental Assessment Act*. We identify our concerns that the purpose of the undertaking – "to provide a continuous and predictable supply of timber to the forest industry" – is not supported by an up-to-date policy on how much timber is to be produced.

We reiterate our previous ruling that the undertaking is correctly described as the four activities of road access, harvest, renewal and maintenance as well as their planning process.

We consider whether MNR's rationale has adequately demonstrated a need for the undertaking and we examine the alternatives MNR considered in determining that timber management planning is the preferred alternative.

We assess MNR's extremely difficult task of describing the forest environment of the 385,000-square-kilometre Area of the Undertaking, the potential and actual effects of timber management on it, and the means of preventing, changing, mitigating or remedying these effects.

We consider whether MNR's proposed methods of carrying out timber management planning are comprehensive, necessary and acceptable. The evidence of the intervenors was particularly helpful in identifying concerns and problems with these activities.

THE BOARD'S ROLE IN APPLYING THE ACT

According to s. 12(2) of the *Environmental Assessment Act*, when an environmental assessment has been referred to the Board by the Minister of Environment and Energy, the Board must hold a hearing on:

- 12(2) (c) the acceptance or amendment and acceptance of the environmental assessment;
- (d) whether approval to proceed with the undertaking in respect of which the environmental assessment was submitted should or should not be given; and
- (e) whether the approval mentioned in clause (d) should be given subject to terms and conditions and, if so, the provisions of such terms and conditions.

In making a decision about the acceptability of the environmental assessment submitted by MNR, we must look to what is required by s. 5(3):

- 5(3) (a) a description of the purpose of the undertaking;
- (b) a description of and a statement of the rationale for,
 - (i) the undertaking,
 - (ii) the alternative methods of carrying out the undertaking, and
 - (iii) the alternatives to the undertaking;

- (c) a description of,
 - (i) the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,
 - (ii) the effects that will be caused or that might reasonably be expected to be caused to the environment, and
 - (iii) the actions necessary or that may reasonably be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment,

by the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking; and

- (d) an evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking.

In practice, when considering the acceptability of the environmental assessment, the Board considers not only the environmental assessment documentation submitted by the proponent, but also the evidence it receives at the hearing. The decision on acceptability of the environmental assessment and the decision on approval of the undertaking are both based on the entire record of the hearing.

The Purpose of the Act

When applying the Act we are first required to consider its statement of purpose:

The purpose of this Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.

Environmental Assessment Act, R.S.O. 1990, c. E.18. s.2.

In deciding whether the timber management planning undertaking is in keeping with the purpose of the *Environmental Assessment Act*, we asked ourselves two questions. Does timber management planning benefit or "better" the people of Ontario? Would our approval provide for the protection, conservation and wise management of the environment? These concerns have guided every step of our consideration of the complex issues presented during this hearing.

Findings

We are persuaded by the evidence we describe in Chapter 9 that the social and economic benefits of timber management planning are clearly demonstrated, except with respect to Aboriginal communities and this is discussed in Chapter 10. The undertaking of timber management planning is the economic basis of many northern Ontario communities and the forest industry is essential to the Ontario economy. The need for managing the timber resource to ensure a sustainable supply for Ontario's forest products industry is undisputed. We could not approve the undertaking, however, solely on the basis of the high social and economic stakes at risk with our decision.

The *Environmental Assessment Act* establishes a sound environment to be an end that must be respected and protected at all times. While interested parties are entitled to expect us to arrive at a just balance of advantages and disadvantages to them in our decision, we have had to be convinced that our decision would do more than reconcile a range of interests of various affected publics. In coming to a decision, we must find that timber management planning does provide for the protection, conservation and wise management of the environment. We considered evidence on its actual and potential negative and positive effects to make sure that the undertaking demonstrates a favourable balance such that the environmental goals expressed in the purpose of the Act are met.

THE CONCEPT OF A CLASS ENVIRONMENTAL ASSESSMENT

Introduction

The *Environmental Assessment Act* deals primarily with single or specific undertakings, but it also makes reference to a class of undertakings. The concept emerges from a reading of Part VI of the Act, particularly s. 40:

A class of undertakings under this Act or the regulations may be defined with respect to any attribute, quality or characteristic or combination thereof and may be defined to include any number of undertakings under one ownership or more than one ownership and whether or not of the same type or with the same attributes, qualities or characteristics.

The concept can also be attributed to s. 3 which sets out the application of the Act. The language implies the class approach in the words "activities or proposals, plans or programs in respect of enterprises or activities." We note that these references do not explain how

a Class EA is to be considered during the approval process, nor do they explain how an approved Class EA is to be implemented. Our interpretation of the Environmental Assessment Act is that Class EAs are to be treated in much the same way as environmental assessments for "specific" projects or undertakings. Our experience with the timber management planning application, however, is that a Class EA approach has important differences. Although explicit direction is absent in the Act, we are guided by the purpose of the Act and the legislative and institutional context in which it operates in our evaluation of the undertaking of timber management planning as a class environmental assessment.

The practicality of using a Class EA approach to groups of undertakings is clear. Proponents are spared the work of seeking individual approvals for many projects of a repetitive nature whose effects are predictable in their scope and depth (Ex. 994, p. 16). The Class EA has been used as an administrative mechanism by the Ministry of Environment and Energy for the fifteen or so Class EAs (mostly for projects such as municipal road projects, sewage and water systems projects) which MOEE has approved since 1975. A recently published report (ISBN O-7778-1625-3) on EA Reform from MOEE dated July 19, 1993, describes the importance of the Class EA as a regulatory mechanism. Over 76% of undertakings subject to the Act are approved through a Class EA process (at p. 15). To our knowledge, the timber management planning application is the first Class EA to be the subject of the hearing process. The concept of Class EA approval has never been tested before the courts.

The first question for us to consider is whether the Class EA mechanism is suitable for the subject matter of timber management planning.

The Position of the Ministry of Natural Resources

MNR argued that the timber management planning undertaking is appropriately a class of undertakings within the terms of the *Environmental Assessment Act* for these reasons:

- (1) The related activities will be planned and carried out on Crown lands in each of the 90 forest management units in the Area of the Undertaking.
- (2) The activities will be carried out repeatedly over time in each forest management unit in the Area of the Undertaking.
- (3) Although the specific methods used to implement the undertaking will vary from place to place, the range of methods available for use across the area of the undertaking can be described.
- (4) Although the potential effects of the activities, and the measures available to prevent, minimize, mitigate or remedy those effects, will vary from place to place,

the range of effects and measures can be described for the entire Area of the Undertaking.

The Intervenor's Concerns

Because the class environmental assessment is such a potent regulatory mechanism and yet is a relatively new concept and subject to different interpretations, intervenors are concerned about MNR's implementation of this undertaking. Their concern could be described as the potential in a Class EA approval for writing a "blank cheque" to MNR.

The intervenors identified two aspects to this concern. The first is that this undertaking is not well suited to a Class EA approval. FFT argued that this undertaking is "ill-suited" for Class EA approval and that the effects of the undertaking are not, in fact, "small scale," "predictable" or "minor." We note, however, that FFT is not requesting that we withhold approval, so long as their proposed conditions are applied, which implies that the Class EA process can be used with appropriate safeguards, i.e., Conditions of Approval.

The second aspect is that MNR cannot be trusted to implement the undertaking in a satisfactory way. The Coalition stressed this in final argument (trans: vol. 404, p. 69089) in its characterization of MNR as being high-handed and too powerful. The intervenors worry, therefore, that MNR could use the Class EA approval as the justification for implementing Timber Management Plans without adequate environmental planning or specific scrutiny otherwise required by the *Environmental Assessment Act*.

The Relationship Between the Class EA Approval and the Requirements of the Environmental Assessment Act.

Two Ontario government ministries are involved in timber management. MNR is the proponent and with our approval would be entrusted with the task of implementing the undertaking according to our conditions. It is MOEE's responsibility, prescribed in statute and specified in this approval, to ensure compliance by MNR to the terms of this approval and with the Act generally. Both ministries thereby play a role in ensuring that this undertaking continues to meet the requirements of good environmental planning.

As a general proposition, we believe MNR does not avoid further compliance with the *Environmental Assessment Act* upon approval under the Act. A Class EA approval satisfies particular requirements of the Act to the extent we specify. An approval in no way lessens or waives the requirements of the Act. It only satisfies them. Other substantive and

procedural requirements of law would continue to apply to MNR and to the implementation of the undertaking. An example of how this concept applies is the "bump-up" mechanism. A specific environmental assessment can be requested by anyone and an environmental assessment can be ordered by the Minister of Environment and Energy in circumstances where a more extensive planning process is required because of the nature of the environment to be affected. Bump-up is for circumstances where, for some reason unseen by this approval (i.e., the undertaking as approved and the Conditions of Approval), a situation is encountered in which the only way to ensure good environmental planning as required by the Act is to require preparation of a specific environmental assessment. Also, and although it might appear too obvious for discussion, when an approval of this undertaking expires, MNR is faced once again with submitting the timber management planning undertaking to MOEE for review and approval.

To What Extent Must MNR "Continue" to Observe Subsection 5(3) of the *Environmental Assessment Act*?

MNR argued that the application of s. 5(3) of the Act occurs only once in a Class EA approval (as it would in an individual EA) and that is now, at the moment of this decision. If MNR's submission means that the proponent might not have to meet the planning requirements of s. 5(3) of the Act, since a Class EA by definition projects environmental planning decisions into the future, we disagree for the following reasons.

Subsection 5(3) of the *Environmental Assessment Act* is central to the function of the Act and by extension, to this hearing. It does two things. First, it sets out that a proponent must produce an environmental assessment of the proposed undertaking. This is a process requirement which must be observed in the course of seeking approval under the Act. Second, it specifies the necessary elements of the environment assessment to be certain kinds of information, analysis and reasoning. These are substantive requirements.

By its specific terms, s. 5 requires the procedural step which is necessary to obtain approval under the Act: the preparation and submission for approval of an environmental assessment. Section 5 contemplates this process occurring only one time. With this approval MNR has discharged its responsibility to provide an environmental assessment pursuant to s. 5(1) and the other procedural requirements of the Act which are to be observed in order to obtain an approval for this undertaking. However, s. 5(3) must be construed in the context of a Class EA application such as this one.

The substantive requirements of s. 5(3) embody the minimum standards of sound environmental planning and decision making. For instance, paragraph 5(3) requires a description of the rationale for the undertaking – that is to say, why it is needed and why it is the preferable choice among its alternatives. It also requires a description in the proponent's application of the undertaking, alternatives to the undertaking, alternative methods of carrying out the undertaking and mitigation measures (paragraph 5(3)(c)). These concepts are all fundamental principles of good environmental planning.

However, it is not correct to conclude that all of the decisions about alternatives, effects and mitigation measures can be made with this Class EA approval. We believe that those downstream decisions – those not made by us but by timber management planners and operational personnel who will implement this undertaking – must also continue to meet the substantive requirements of s. 5(3) of the Act. The submission noted above in MNR's final argument is troublesome because it confuses the procedure required by s. 5 with its substance and it suggests that a Class EA approval would settle all future issues of the requirements of sound environmental planning during timber management planning. This threatens to overlook the serious implication that the substance of the *Environmental Assessment Act* must be met not only here, at the moment of the Class EA hearing and decision, but also during the term of the approval in the planning process. This is not to say, however, that each five-year Timber Management Plan must re-invent the EA process contemplated in s. 5. The management unit planning process must pursue the process of good environmental planning only to the extent that the class EA approval leaves issues unsettled.

With a Class EA approval MNR can implement Timber Management Planning, satisfied that it has met the standard necessary for approval; subject to Conditions of Approval, it may proceed. The undertaking can be implemented without further application of the EA Act process by the Ministry of Environment and Energy, except in the situation of a successful bump-up request (see p. 106 of Chapter 3). This means that MNR would not, during the term of a Class EA approval, be required to submit for approval: its purpose "to provide a continuous and predictable supply of wood for Ontario's forest products industry," its rationale establishing the need for this undertaking and why it is the preferable choice among its various alternatives. These are very important substantive issues to be settled by this Class EA approval and not subject to future debate in the planning process at the management unit level.

Based on the facts before us, we do not see this as writing a "blank cheque" to MNR. MNR will have considerable autonomy but at all times will be bound by the Class EA approval, and by extension to the substance of the *Environmental Assessment Act*. Moreover, MOEE

maintains its legal obligation to monitor and enforce compliance to this approval and, by extension, the principles of sound environmental planning. Besides bump-up, a Class EA approval provides other "control" mechanisms to MOEE by providing as a Condition of Approval for MOEE to receive progress reports from MNR during this approval and for the Minister of Environment and Energy to approve any changes to this approval for the undertaking that may be required during its term. Also, when the term of this approval has expired, MNR will be faced with the necessity of again seeking approval for this undertaking pursuant to the *Environmental Assessment Act*. Furthermore, MOEE has recourse in law to enforce compliance. In effect, MNR is provided with the authority sufficient to carry on managing the timber resource and planning the activities, constrained only by the limits prescribed in the Conditions of Approval and other applicable law.

The Present and the Future

A Class EA approval operates in three distinct phases. The first phase deals with specific matters capable of being settled on the evidence before us. These are issues of a common nature which will have common effect throughout the Class of undertakings and by and large are settled once and for all by the Class EA approval. The second deals with future uncertainty; this is accomplished primarily by the planning process prescribed by the Class EA approval, which is discussed in Chapter 3. It is also accomplished through various conditions requiring ongoing development, research, reporting and monitoring, which we discuss in Chapters 8 and 11. The third phase deals with matters extending beyond Board approval and requiring specific intervention by the Minister of Environment and Energy through application of the *Environmental Assessment Act* during the term of this approval. This is accomplished by the bump-up request process and by the process governing amendments to an approval (Conditions 70 and 112).

Thus, a Class EA approval is potent precisely because it removes the requirement of an *Environmental Assessment Act* approval for its constituent undertakings, which are the individual timber management plans to be developed and implemented every five years on each of the 90 management units.

Unlike an EA approval for an individual undertaking or for a plan or program of activities or undertakings, there will normally be no specific *Environment Assessment Act* approval required for the downstream undertaking. We must satisfy ourselves, therefore, that the constituent parts of the Class EA can proceed to planning and implementation without specific application of the *Environmental Assessment Act*, while still meeting its substantive

requirements, before we can accept the environmental assessment and approve the undertaking.

We considered the issues that are sufficiently common as to be dealt with and settled by the Class EA. For example, the need for timber management planning across the area of the undertaking is one such common issue. Consequently, it must be understood that an approval gives MNR permission to pursue its stated purpose of supplying timber to the forest industry. This purpose will be pursued across the area of the undertaking, in each of the 90 management units. This purpose is to be achieved by the timber management planning undertaking as described and subject to Conditions of Approval.

Subject to this approval, MNR will be free to conduct the activities of access, harvest, renewal and maintenance across the area of the undertaking. Their timing, location and intensity would, however, be subject to a planning process common to all management units as prescribed in Conditions of Approval. The second phase of the Class EA approval is designed to cope with the future unknowns which will be encountered during planning on individual management units. During the term of an approval, timber management planning can in theory be conducted with no further specific *Environmental Assessment Act* approval.

The evidence before us establishes that MNR is staffed with conscientious professionals at all levels. Moreover, there has been a consistent demonstration throughout this hearing that MNR is working hard to make its administrative and planning apparatus work well and to improve it. We are also confident that the terms of approval allow the public of Ontario to play an increasingly important role in scrutinizing MNR. As a back-stop to all of this is the fact of MOEE's ongoing role in ensuring compliance with an approval and to other applicable law.

Findings

We find on the facts before us that MNR's characterization of the timber management planning undertaking is appropriate for description as a class within the meaning of the *Environmental Assessment Act*. Timber management activities are sufficiently repetitive and interdependent to be the subject of a common planning process. Furthermore, we are satisfied that their potential effects and mitigative measures are well enough understood as to be appropriately the subject matter of a class environmental assessment.

THE ACCEPTABILITY OF THE CLASS EA

Introduction

The sufficiency of the timber management planning class environmental assessment is fundamental to our determination of its acceptability. The *Environmental Assessment Act* is an environmental planning statute and it seeks to protect the environment through good planning. An environmental assessment placed before the EA Board must meet the planning requirements of s. 5(3) in order to be judged acceptable.

Purpose of the Undertaking

The specific requirement of s. 5(3) starts with a description of the proponent's purpose (s. 5(3)(a)). This is fundamental to the assessment of the need for the undertaking and the choice of the preferred alternative submitted by the proponent. The statement of purpose identifies the problem or opportunity which the proponent seeks to address by the undertaking. MNR describes its purpose in these terms:

The purpose of the undertaking is to provide a continuous and predictable supply of wood for Ontario's forest products industry.

(Ex. 4, p. 1).

It is the proponent which chooses the purpose and then describes it. We have asked ourselves whether this statement of purpose is sufficient to provide an acceptable basis for the description of the rationale for the undertaking, alternatives to the undertaking and the advantages and disadvantages. MNR's statement of purpose suggests to us two issues which go to its sufficiency:

1. it does not set out how much timber is to be produced, and
2. it does not characterize what is meant by the words "continuous and predictable" as they relate to timber supply.

First, MNR submits that production levels for timber supply are required by the *Crown Timber Act* to meet a standard of "sustained yield." Also, it is clear to us that the amount of production is implicitly related to the demand requirements of Ontario's forest products industry. Thus, while not specifically quantified, this statement of purpose does contemplate a level of production sufficient to meet industrial demand. MNR's mechanism for specifying

and quantifying production level options has been the "Forest Production Policy" (Ex. 136), which is more than 20 years old and admittedly outdated (trans: vol. 29, p. 4882). MNR told us throughout the hearing that it was working on a new Timber Production Policy. The reasons it gave to explain why the policy was not ready for consideration in our decision are:

Production options and associated costs required to secure a sustainable supply of timber to meet Ontario's socio-economic needs will be developed after completion of the Independent Audit, the Comprehensive Forest Policy Framework and the ruling of the Timber Management EA Board and will take all into account.

(Ex. 2309, MNR Reply 4, p. 33).

In the absence of compelling evidence and argument which would require a more concrete statement of production levels, and in view of evidence we discuss on p. 150 of Chapter 5, which establishes that this ongoing undertaking has not exceeded reasonable standards of sustainability, we are willing to accept this lack of quantification. The development of a new Timber Production Policy is discussed in Chapter 11. We are also satisfied that MNR will formulate its Timber Production Policy based upon the requirements of any approval we give, as well as the statutory obligation to manage the resource in a sustainable fashion, and other relevant matters.

As for the second point, MNR argues that the level of production of its timber management efforts cannot be based upon the statistical concept of the "ideal forest." To do so would be a gross oversimplification of the nature of incremental growth in the forest and it overlooks the fact that Ontario's forests are not in the statistical sense, of a uniform age-class distribution but are dominated by older age classes. For this reason, the concept of "predictable and continuous supply" is provided and explained by MNR as a more flexible approach that factors in the dynamic nature of incremental yield in the forests of Ontario. We accept this position. A literal interpretation of The *Crown Timber Act's* requirement of "sustained yield" management could lead to the idea that each year's harvest must be limited to that year's growth. Given the reality of Ontario's forests, a literal interpretation can lead to an unworkable if not absurd situation. We accept this aspect of MNR's interpretation of the meaning of "sustained yield" and its description of this concept in its statement of purpose. We discuss this matter in detail beginning on p. 153 of Chapter 5.

MNR's statement of purpose has also been criticized as literally and factually "missing the forest for the trees." The Class EA has been criticized for focusing on the primacy of timber supply to the detriment of a more holistic management approach which recognizes and elevates all other values associated with the "forest" environment of Ontario. It is argued

that MNR's purpose is too narrow and unacceptably limits consideration of other methods of pursuing the undertaking such as "integrated forest management."

Finding

The intervenors criticized MNR's stated purpose of supplying timber to the forest industry as being too narrow and giving priority to timber over other forest resources. We cannot require a change to the description of the purpose of the undertaking that would have the effect of dictating MNR's priorities in managing the resources committed by law to its care. We must however consider this choice in the context of the *Environmental Assessment Act's* purpose. We have determined that within the strictures of the *Environmental Assessment Act*, and our findings with regard to mitigating effects of the undertaking, this statement of purpose is acceptable.

Description of the Undertaking

The description of the undertaking required by the *Environmental Assessment Act* (s. 5(3)(b)(i)) serves to focus the proponent's reasoning. It provides clear notice of what the proponent asks to have approved in the application. It is this description which underpins the further content of the Class EA.

The undertaking before us is described by MNR as follows:

Timber management consists of the following sequence of related activities:

- (i) provision of access to harvestable timber;
- (ii) harvest of the timber for transport to wood-processing facilities;
- (iii) renewal of that timber resource, which involves:
 - (a) preparing the site for regeneration;
 - (b) regenerating the timber by natural or artificial means;
- (iv) maintenance of the timber resource, which involves:
 - (a) tending operations to ensure successful growth of the new forest;
 - (b) protection of the timber resource from insects and disease.

However narrowly the timber management undertaking is defined, it is our understanding that MNR's role in timber management planning goes well beyond the pursuit of supplying timber to the forest industry. What we seek to do in considering this undertaking is to ensure that non-timber values, resources and the environment are not unacceptably impaired by the way timber management occurs. We will not endorse a result which would effectively change the undertaking in its purpose or definition beyond what, on the evidence, we have found it to be.

On January 17, 1990, we ruled on licensing matters and the definition of MNR's undertaking. Based on the case provided by MNR and the evidence at the hearing, it was clear to us that the undertaking is in fact characterized by an essential element of planning. It remains our view that the *Environmental Assessment Act* contemplates that an undertaking which is the subject of a Class EA such as this one, being a proposal, plan or program in respect of the activities of access, harvest, renewal and maintenance, bears an implicit element of planning. This does not mean however that we interpret the *Environmental Assessment Act* and the facts before us as somehow defining the undertaking purely and exclusively as a planning process. To do so would logically place the four component activities of accessing the resource, harvesting it, renewal of the resource and maintenance of the resource beyond the description of the undertaking. It has been demonstrated clearly at this hearing that these four activities are at the heart of this undertaking as is their planning. To interpret our ruling of January 17, 1990, as somehow severing the four activities from the description of the undertaking is wrong. On the facts, the undertaking before us is not simply and exclusively a planning process. Such an interpretation was argued by FFT.

It is FFT's view that the activities of access, harvest, renewal and maintenance as proposed by MNR are actually an alternative method of carrying out the undertaking, a method which on the evidence is inferior to the "method" of "Integrated Forest Management" proposed by FFT. While we agree that the methods of pursuing this undertaking are varied and broad we cannot agree with FFT that the four activities are an inferior means of meeting the purpose of the undertaking. We believe that "Integrated Forest Management" as described by FFT as a method of achieving the purpose of the undertaking is at present beyond the ability of the proponent to implement. Further integration of forest resource management is a clearly stated goal of MNR and we expect that as these methods become more feasible, MNR will diligently and conscientiously implement them.

MNR interprets our ruling of January 17, 1990, as raising various ambiguities. Among them is the concern that future specific environmental assessments required pursuant to the bump-up process should not arise from mere "planning" issues. The proponent argued:

... while the planning process can be described as "part of the undertaking" in an environmental assessment of a class of undertakings, future individual environmental assessments arising from bump-ups during implementation of the approved class of undertakings are not intended to include a re-examination of the "planning process."

The bump-up process does not provide the right to re-invent or re-do the five-year Timber Management Plan on any given unit. It does provide, however, that planning matters can be a ground for requesting a bump-up. We agree with MOEE's draft Guideline on Interim Criteria for Evaluating Exemption, Designation and Bump-Up Requests (Ex. 2200B, Tab 11, p. 8) which clearly and correctly considers public consultation and planning matters in such determinations. Contrary to MNR's submission, it is our expectation that specific timber management plans as well as their specific planning processes and the specific operational components of the activities planned can be scrutinized by the bump-up process. This would happen if it were established that, in certain circumstances, an approved planning process is not complied with or does not address a particular problem.

Findings

Subject to our ruling of January 17, 1990, where we made a particular finding as to the inclusion of "planning" as an element of the undertaking, we find the description of the undertaking provided by MNR meets the standard imposed by the *Environmental Assessment Act*.

Rationale for the Undertaking

The Need for Timber Management Planning

The parties to the hearing do not dispute the need for this undertaking. MNR and OFIA have placed before us abundant evidence establishing a compelling social and economic need to provide the timber resource for the forest industry. We have also seen persuasive evidence supporting the need to manage the resource by the provision of access, harvest, renewal and maintenance.

Almost all the parties recommended that we approve the undertaking contingent on acceptance of their own proposed Conditions of Approval, which vary significantly. We understand that, at a minimum, there is general accord among them that MNR has demonstrated a need for supplying the forest industry with timber from Crown Lands in Ontario. We agree with the parties that the case before us has adequately demonstrated a need for the undertaking of timber management planning. In describing the need for this undertaking, MNR developed alternatives to the undertaking, (Ex. 4, p. 4; Ex. 984, pp. 25-33) including consideration of doing nothing, or as it is called, the "null alternative."

The purpose of a null analysis is essentially to support the demonstration of need for an undertaking. MNR defined the null approach as one of supplying timber from imports and from private lands but none from Crown lands. (Ex. 4., p. 18; Ex. 984, pp. 27-29). The evidence showed that the purpose of the undertaking could not be met by such a choice.

Not all of the parties agreed, however, that MNR's case adequately demonstrated need for the undertaking at the local or management unit level. It was submitted that while the need for a provincial program of timber management planning is clear, each management unit planning team must ask itself at the outset of developing that unit's five-year plan, whether the undertaking should be pursued.

It is clear on the evidence that timber management planning and the purpose of this undertaking are clearly bound to the participation by all management units in the area of the undertaking. There is no possible way in which management units can operate while ignoring the purpose of the undertaking. These units are geographically distinct administrative jurisdictions for management purposes. They are not so distinct, however, that their participation in timber management planning can be subject to re-assessing the fundamental question of their participation. MNR presented sufficient evidence of the need to require all management units to contribute to the provincial goal. For instance, wood supply shortages in one management unit can and are addressed by supply from others; management of regeneration, access and maintenance activity in adjoining management units is often inter-connected; co-ordination and planning of non-timber values are also similarly related between and among management units. Therefore, we believe that MNR is not required to demonstrate need in the case of each unit's five-year Plan. We believe that proven need for the undertaking demonstrates need for the participation of each unit.

Findings

MNR persuaded us that the need to supply timber to the forest industry is motivated by compelling economic and social grounds. These grounds have been adequately

demonstrated as we describe in detail in Chapter 9. The evidence before us persuades us of the need for the undertaking.

MNR's Alternatives to Timber Management Planning

In its rationale, a proponent must also demonstrate why, beyond proceeding at all, the chosen course is preferable to other ways of achieving its purpose.

MNR analyzed four alternatives to the undertaking:

- (1) The preferred alternative of timber management as proposed by MNR in its application.
- (2) The do nothing/null alternative.
- (3) The alternative of harvesting the timber with no regeneration, and applying the guidelines to protect non-timber values.
- (4) The alternative of the harvest with no regeneration and no protection guidelines for non-timber values.

MNR also responded to the intervenors' concerns that recycling of newsprint was not adequately considered in its analysis of alternatives. We heard from MNR witness John Duncanson during MNR's Panel 17 that recycling provides only about 30% of fibre for pulp and paper manufacture at the present time and is not expected to increase substantially because of the problems of collecting and transporting newsprint and the costs involved (Response to Board Interrogatory 34). MNR argues that while important, recycling of fibre cannot stand alone as a reasonable alternative to the undertaking. We agree.

When considering the sufficiency of MNR's assessment of alternatives to the undertaking it is necessary to bear in mind the stated purpose of supplying timber to the forest industry. By definition these alternatives must meet this objective and they must be reasonable options in the context of the facts.

A proponent cannot present the Board with fanciful nor unsubstantial alternatives in the hope of making its preferred alternative appear more compelling; the alternative considered must be credible. Similarly, the range of alternatives to the undertaking must be reasonably comprehensive. The planning process reflected in the environmental assessment must demonstrate that reasonable alternatives have been considered and that they have been considered in adequate depth. We must be convinced that MNR's preferred choice came

from a vigorous and expansive consideration of reasonable options. We recognize, however, that opponents to an application may never be satisfied with the level of detail in which a proponent analyzes the alternatives to its undertaking and for this reason we agree with previous Board decisions that the process cannot be "endless." As the Board said in Re Ministry of Transportation and Communications Realignment of Highway 69 Application (Registrar's 1 File No. EA 85-01), Decision and Reasons for Decision dated May 27, 1986. at pp. 26-28:

The environmental assessment process under the current legislation does not require, in the Board's view, an examination of every possible alternative but only those alternatives that might reasonably be put forward as both practical and feasible alternatives to that proposed by the proponent. Since the assessment is undertaken by the proponent, the reasonableness of precisely which alternatives are to be assessed and to what extent must be left, in the first instance, to the subjective judgement of the proponent with the Board ultimately charged with the task of reviewing the process in the light of all of the evidence and determining whether or not there has in fact been reasonable and substantial compliance with the requirements of the Act. It is unreasonable to require the proponent to examine all alternatives in the same manner and to the same degree for any such requirements which surely renders the assessment process completely unmanageable in terms of time and expense.

The Board is of the opinion that the proponent in most cases need only examine alternatives to the undertaking and alternative methods of carrying out the undertaking necessary to reach some reasonable conclusion in relation to the proposal which is the subject matter of the application before the Board...

Therefore, the *Environmental Assessment Act* requires that a proponent's rationale consider alternatives to the undertaking beyond the simple question of null alternative analysis. The examination of alternatives to the undertaking should result in the definition of the "preferred" alternative (i.e., the undertaking) and should demonstrate why it is preferable to a range of distinct but reasonable and credible options.

Of the alternatives to the undertaking, MNR defined what it considers to be its preferred alternative – timber management planning. We accept MNR's choice as the best alternative to achieve the purpose of the undertaking. We are persuaded by the evidence we heard that the purpose could not be achieved by an alternative that did not involve artificial regeneration. We are also persuaded that an alternative which does not protect non-timber values through the application of guidelines is unacceptable. The undertaking selected must carefully consider timber and non-timber values. The forests of this province must be managed in order to achieve the purpose of providing a continuous and predictable supply of timber to the forest industry of Ontario. No party has submitted an alternative to this

undertaking which is preferable and which could meet this test. The intervenors did suggest various approaches to pursuing the undertaking in what they described as a more holistic or integrated manner, and we discuss these on p. 67.

Findings

We conclude that MNR has set forth in the Class EA and in its evidence an acceptable roster of reasonable alternatives to this undertaking. We find that MNR's proposed timber management planning undertaking is the best alternative available at the present time to achieve the stated purpose of supplying timber to the forest industry. Having accepted the need for the undertaking and that the chosen alternative is the preferable one, we find the proponent's rationale to be acceptable.

Environment Affected by the Undertaking

Description of the Environment that Will or May Be Affected

The *Environmental Assessment Act* (s. 5(3)(c)(i)) requires a description of the Environment to demonstrate an adequate awareness and knowledge of the environment with which the undertaking is concerned. The scope of the definition of the word "environment" as provided in the *Environmental Assessment Act* is huge:

(c) "environment" means,

- (i) air, land or water,
- (ii) plant and animal life, including man,
- (iii) the social, economic and cultural conditions that influence the life of man or a community,
- (iv) any building, structure, machine or other device or thing made by man,
- (v) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or
- (vi) any part or combination of the foregoing and the interrelationships between any two or more of them,

in or of Ontario.

(s. 1(c))

We observed also that the description of the forest environment is capable of divergent views and perspectives. For example, the forest, its value and importance were described to us very differently by loggers, paperworkers and northern business people than by remote tourist operators, anglers and hunters. Other views are held by Aboriginal peoples and wilderness enthusiasts and environmentalists.

MNR's Position

MNR provided us with a description and demonstration of its knowledge of the 385,000-square-kilometre Area of the Undertaking and its activities in learning about it. MNR has described in the Class EA and at the hearing its many ongoing and developing initiatives in monitoring, data collection and inventory activities. We heard of specific initiatives and data bases dealing with:

- the forest;
- the water;
- wildlife and plants;
- socio-economics; and
- the human and cultural environment.

MNR submits that it has demonstrated an adequate knowledge of the environment affected for the purposes of an approval and an adequate ability to assemble information necessary for sound planning of specific timber management plans during the term of approval.

The parameters of the description required in the Class EA must also be tempered by a standard of reasonableness. We recognize the immensity of MNR's task in coping with the physical, human, social and economic environment expressed in this application. The futility of hoping ever to know in anything approaching "complete" detail all the aspects of the affected environment is clear, and, in our view, is not a reasonable expectation in these circumstances. Moreover, in the context of a Class EA approval, it is clear that there are future unknowns and uncertainties. Future information requirements may not be known in many instances until late in the Plan implementation stage. The forest by its nature is not a static thing. Information requirements are, therefore, subject to constant revision and rationalization. The work of foresters and resource managers changes and innovates

accepted practice and also experiments with novel approaches. Tomorrow's innovations will arrive on the scene and we encourage such improvements in information gathering activities as we do with all aspects of timber management planning.

The Intervenor's Criticisms

We have considered various proposals put before us as they relate to the information requirements of timber management planning. Generally, the intervenors criticize what they perceive as the lack of information on non-timber values or say that where such information exists, more effort is required by MNR to consider it in timber management planning. FFT criticized the lack of ecosystem-based planning information (Ex. 1711, FFT Panel 9 Witness Statement, pp. 32-35.) The Coalition stressed that MNR's "constraint" as opposed to "objective" oriented management approach is flawed. This has led to the situation where a lot of information is available on non-timber resources but this information is not being used in timber management planning in a way that will have a serious impact on the important decisions. (See, for instance, vol. 404, p. 69084 and p. 69091 and vol. 405, pp. 69417-19).

The intervenors urge various proposals and conditions designed to address what they see as problems with information on non-timber values and we discuss these in Chapters 3 and 8. Their respective proposals serve to underpin wider objectives found in their cases. The Coalition urges us to require MNR to practice an "adaptive management" approach that contemplates accelerated and wider inventory of resource values. Similarly, FFT focuses on MNR's "background information" proposals in its criticism. While FFT expresses support for MNR's Forest Resources Inventory and fisheries and wildlife information proposals, FFT seeks enhanced effort in soil and slope inventories, recreational resources and visual resources. These proposals also speak to FFT's desire to integrate resource management further and to formalize MNR's commitment to do so.

Findings

We believe MNR's description of the environment that will or may be affected by the undertaking is acceptable. We have been very impressed by the knowledge and awareness of the environment of MNR staff foresters, technicians and others who work day to day at the task of managing the forest. Their skill, understanding and intuitive knowledge of the lands committed to their care gives us considerable confidence in MNR's ability to cope with the challenges of keeping track of the information requirements of planning and carrying out operations at the management unit level. MNR has been candid in

acknowledging where gaps exist in its ability to survey and co-ordinate information gathering in order to manage forestry on a scale at the provincial and regional level. The challenges they face include co-ordination of effort on inventory, projection of supply and regeneration. These are serious concerns which MNR is facing, in a real sense for the first time. MNR admitted to shortcomings in its structures and management abilities at these higher levels.

We are satisfied, however, that MNR's ability to cope with the effects of the undertaking, and to maintain a sufficient awareness of the environment in the area of the undertaking is sound, given the initiatives we are ordering.

We accept MNR's description of the environment that will or may be affected, as contained in the Class EA and in the evidence before us.

Effects of the Undertaking

The planning requirements of the *Environmental Assessment Act* (s. 5(3)(c)(ii)) require the Class EA to describe actual and potential environmental effects of the undertaking. These effects can be both positive and negative.

MNR submits that the effects of timber management planning so closely mimic ongoing natural forest disturbance patterns, such as fire, blowdown and insect infestation, as to be acceptable. While we accept the general thrust of this submission, we find that so much uncertainty exists as to make this statement a cautious boast. In many ways, it is a theoretical claim because we have not yet seen a new forest reach mature rotation age in the place of the one MNR has been clearcutting, spraying with herbicides, and regenerating by planting and seeding at an accelerating pace since the 1960s. Ongoing and careful monitoring is needed in order to subject this theory to the rigorous scrutiny it demands.

Of great concern to us and to the intervenors is the level of uncertainty associated with the many potential effects. While MNR has made great strides in coping with this problem, we note that these effects by definition exist in the realm of cautious deduction and logic. We are asked to accept risks on the evidence that the forests have been subjected to human intervention for a long time and appear to be getting by. We are asked, specifically, to accept that the effects of the undertaking are not significantly different from natural disturbance patterns, that the total management approach adequately mitigates adverse effects and that there exists an adequate level of scientific and technical knowledge to cope with the residual uncertainty as to potential effects. At the same time, MNR argues that very little credible evidence has been provided to counter its case that the effects are

acceptable and foreseeable such that mitigative measures can be identified, planned and implemented. We agree with this argument. The particulars of our findings as they relate to the environmental effects of road building, harvest, renewal and maintenance are contained in Chapters 4, 5, 6 and 7.

Findings

Over the four and one half years of this hearing we heard evidence concerning a seemingly limitless array of actual and possible effects of the timber management planning undertaking on the environment. Generally, we find the Class EA and the evidence we heard to have adequately described the effects of the undertaking and alternative methods of carrying out the undertaking and the actions necessary to prevent, change, mitigate or remedy such environmental effects. These matters are discussed in the following reasons, particularly Chapters 4, 5, 6 and 7.

Alternative Methods of Carrying Out The Undertaking

The Four Activities

The *Environmental Assessment Act* (s. 5(3)(b)(iii)) requires the Class EA to describe alternative methods of carrying out the undertaking. The intervenors have also provided elaborate and exhaustive proposals of their own in this regard. The traditional analysis of what constitutes "alternative methods of carrying out the undertaking" breaks down to some extent in the context of a Class EA. This is because the nature of the undertaking itself is not a tangible, physical construct such as a landfill or a road, but an abstract management process by which the operational elements of timber management are planned and implemented over time and into the future. "Alternative methods" of implementing the proponent's stated preferred alternative are sometimes difficult to distinguish from "alternatives to" the undertaking because of the intertwined concepts of "timber management" and "planning." It must be emphasized, however, as we stated at p. 56 under the heading "Description of the Undertaking," that the undertaking is not planning alone; it involves the planning of the activities of access, harvest, renewal and maintenance.

The Act requires us to consider the alternative methods of carrying out the undertaking placed before us. The Act also provides us with the authority to specify terms and conditions. Under s. 14(1)(b), among the matters Conditions of Approval may require or specify are:

- (i) the methods and phasing of the carrying out of the undertaking;
- (ii) the works or actions to prevent, mitigate or remedy effects of the undertaking on the environment;
- (iii) ... research, investigations, studies and monitoring programs related to the undertaking, and reports thereof ...

The Conditions of Approval we are providing are a collection of agreed conditions, conditions proposed by the proponent and the intervenors and, where we have found it necessary, of our own accord. We have carefully considered the enormous amount of evidence we received on the different methods of carrying out road building, harvest, renewal and maintenance and while we find many of MNR's proposals to be acceptable, we have in some cases been persuaded otherwise by the intervenors. For example, we were persuaded, against MNR's opposition, to impose a range of clearcut sizes in Condition 27. We ordered that two species that need older forests, the pine marten and the pileated woodpecker, be added to MNR's list of "featured" species to be given special attention in timber management planning. On the other hand, we have rejected arguments that the natural renewal methods should be adopted to substitute for or decrease artificial regeneration treatments (Chapter 6).

Generally speaking, our Conditions of Approval are of two kinds. The first are concerned with the specific operational conditions which settle how a particular operation or activity must be carried out. The second are conditions setting out a planning process which provides a range of possibilities to be applied to operational issues as they arise. For example, the operational conditions spell out uniform operational requirements such as restricting clearcuts to a range of sizes not to exceed 260 hectares (subject to exceptions). The planning conditions provide a range of possibilities such as those setting out a planning process to locate and design a road. Unlike a specific individual EA approval, by definition a Class EA approval must to some extent specify as an approved "method" of implementation some form of planning process. It will be observed that the attached Conditions of Approval have far more to do with planning than setting down specific operational requirements. This is largely because of the nature of timber management planning as an evolving set of activities applying to a living resource and a dynamic environment.

The Planning Process

This "method" of carrying out the undertaking is embodied by and large in the planning process we describe in Chapter 3. The planning process in turn will apply our direction to

future timber management activities while continuing to observe the standard of good environmental planning as required by the *Environmental Assessment Act*. The planning process is designed to provide a consistent and common approach to timber management planning across the Area of the Undertaking. A common planning approach is necessary in order for MNR to produce timber management plans for the 90 Management Units every five years, and to produce comparable data across Ontario. This is necessary to assess progress systematically in achieving the purpose of the undertaking.

A common planning process is also needed to ensure a reasonable level of consistency across Ontario and to allow review in nine years, when the approval has expired, by the Ministry of Environment and Energy. The planning process should be the vehicle for the "owners" of the timber resource and all other forest related values to participate in the planning and protection of their environment. Therefore, we have provided Conditions of Approval requiring extensive public consultation.

Findings

We find the many alternative methods of carrying out the undertaking proposed by MNR for the activities of access, harvest, renewal and maintenance and the overall planning process to be acceptable. The Class EA describes the alternative methods of carrying out the undertaking, the effects of alternative methods and mitigation means needed to address effects.

We find that the Class EA and the evidence we heard have adequately evaluated the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking. These matters are also discussed in the reasons that follow, particularly Chapters 4, 5, 6 and 7.

We find the Class EA submitted by MNR to be acceptable.

Integrated Forest Management

As we noted earlier, the intervenors proposed that integrated forest management was better than timber management planning. The intervenors proposed at various times during the hearing that the purpose of the timber management planning undertaking should be expanded to include "forest" management and that "forest" management was an acceptable method of carrying out the timber management planning undertaking. We think that the

integrated forest management approach has the potential for becoming a method of carrying out this undertaking but today remains undefined and undeveloped.

FFT argued that integrated forest management should include "ecosystem management" and "landscape management." The Coalition characterized its proposal as "comprehensive integrated timber management planning" (Ex. 2128, p. 18, para. 25), which they distinguish from the broader concepts of "forest management" and "integrated resource management."

Generally, the intervenors argued that MNR took an excessively narrow view of the means of achieving its stated purpose. They criticized the undertaking for lacking a holistic approach to managing for a comprehensive range of resource values from the forest estate; timber being only one of them. We observe that MNR itself presented evidence on the desirability of a more integrated method of managing the forests in order to achieve its stated purpose and we discuss this evidence further in Chapter 11, p. 379.

We believe that these concepts hold the promise of improving the approved method of carrying out this undertaking in the future. We find, however, that no one was able to demonstrate to our satisfaction how a truly "integrated forest resource management" approach might work. The proposed Conditions of Approval from FFT and the Coalition, which would achieve this end, appear to us to be unworkable at the present time. Also, the preponderance of expert opinion we heard leads us to conclude that such an approach needs investigation and development before it is implemented. Necessary efforts toward quantification of various resource values, co-ordination of their management and the means of optimization are under way.

We are convinced that as a general proposition the trend toward an integrated forest resource management approach is laudable and likely inevitable. It is clear that contained in the proponent's own proposed method of carrying out this undertaking is a considerable element of "integration" of their various resource management activities. We agree with MNR's demonstrated commitment to integration of its resource management activities. In order to facilitate and encourage this trend, our approval requires MNR to proceed with implementation of these concepts as they become feasible. Although the Coalition and FFT urge that these methodologies are feasible now and should be adopted, we are not convinced that it is yet possible nor advisable to do this. We do agree, however, that any improvements in this regard must be pursued and implemented. To this end, Condition 107 requires ongoing investigation into landscape management, biodiversity and habitat supply analysis initiatives; Condition 80 requires ongoing long term scientific effectiveness study of the moose, fish, tourism and other wildlife guidelines. These and other initiatives will be

reported to MOEE and in other reports to the public and the Legislature as discussed in Chapter 8.

MNR's responsibility is not a duty purely to report passively with respect to these conditions. MNR must be active in its efforts to improve and integrate its activities. As MNR improves its methodologies, we expect improved methods to be applied as they become feasible. MNR has the power to adopt these improvements by amending its Timber Management Planning Manual and, where required, by seeking amendment to the approval itself.

Findings

We are persuaded by the evidence of the intervenors and MNR itself that the concept of integrated forest management holds the future possibility of improving the management of timber and other forest resources. As we discuss in Chapter 11, we are requiring MNR to proceed with its proposal to investigate the feasibility of an integrated forest management approach and to implement improvements offered by these new management techniques as they become available. Nothing in our approval of the timber management planning undertaking prevents MNR from adopting improvements that may be demonstrated to be beneficial from its investigation of an integrated forest management approach. In fact, our Conditions of Approval anticipate that MNR will move in the direction of integrated forest management during the term of this approval.

Land Use Planning

MNR argued that we cannot require planners to set objectives for various things which MNR characterizes as land use issues. It was argued that it would be inappropriate to require planners to develop management objectives for such things as the creation of quantified numbers of recreation opportunities, or quantified allocations for protected areas/parks/roadless areas, or a quantified number of remote tourism operations during development of a timber management plan. In MNR's view this would inappropriately turn timber management planning into a policy making exercise in land use planning.

We agree with MNR that land use planning processes provide decisions which designate permitted land uses. The timber management planning process does not do this. For instance, the timber management planning process does not decide where a park goes nor where a wilderness area can be sited. Despite MNR's caution, however, it is undeniable that this undertaking does deal at many levels with land use. The timber management planning process is designed to reconcile various permitted land uses in approved plans and

to specify the operations to be carried out. We believe that our authority to provide conditions of approval is related to issues of land use planning generally. It is MNR's submission that as a rule, matters of land use designation are not within the timber management undertaking, and are beyond our authority to affect. For instance, MNR argued that we are without authority to specify an assessment of "alternative harvest locations" in the plan for public comment. We have nevertheless done so in Condition 34. While we recognize that MNR's land use decisions operate in a distinct sphere from that in which the *Environmental Assessment Act* operates, there is considerable overlap. We therefore reject any reasoning that would exclude or impair our authority to specify Conditions of Approval because of their effect upon land use policy choices. We will order Conditions of Approval that are within the scope of the authority set out by the *Environmental Assessment Act* and are necessary for proper implementation of the undertaking. We observe that the District Land Use Guidelines and Strategic Land Use Plans relied on by MNR exist as policy choices, not generally as statutory or regulatory instruments. MNR told us it intends to review the District Land Use Guidelines and we discuss this further in Chapter 11.

Conclusion

In this chapter, we have tried to distinguish clearly between those issues that are settled by this approval and those which are to be decided through the planning process established under the approval. These questions have been dealt with as they arose, especially in the different "Findings" sections under the headings "The Concept of a Class Environmental Assessment" and "The Acceptability of the Class EA."

To summarize, based on the facts as we have found them, the following issues will be settled:

1. The class environmental assessment is acceptable and MNR can proceed with its timber management planning undertaking subject to the conditions of approval.
2. The purpose of the timber management planning undertaking is "to provide a continuous and predictable supply of wood for Ontario's forest products industry" and it has been accepted.
3. We have accepted that MNR has demonstrated the need for the timber management planning undertaking and why it is the preferred choice among the alternatives analyzed. This means that timber management planning can be conducted throughout the area of the undertaking without establishing the need to supply timber for each 5-year Plan in each of the 90 management units.

4. None of the above issues is open for debate at the management unit level.

In Condition 113, we are approving the undertaking for a term of nine years, as proposed by MNR. Some intervenors argued that the standard term for a class environmental assessment approval is five years and that this shorter time would be appropriate in this case to allow a more timely review of changing practices and circumstances. We were persuaded by MNR witness Frank Kennedy's evidence (trans: vol. 394, pp. 67796-800) that it will take several years to put into effect all of the conditions we are ordering, and still more time to see the effects emerge in the slow-growing forest of northern Ontario.

MNR proposed that this approval would be "...deemed to start on the first day of April after final approval has been given." Section 23 of the *Environmental Assessment Act* governs appeals of our decision. Subsection 23(2) of the Act provides that our decision is only final after the expiration of the period or periods mentioned in subsection 23(1). Subsection 23(1) contemplates an appeal period of 28 days "... or within such longer period as may be determined by the Minister ..." The appeal period therefore can be indefinite. To make the implementation of this approval contingent on an indefinite future date threatens to delay work on many important initiatives we are requiring by this approval. We have therefore ordered in Condition 113 that this approval will take effect upon the date of its release.

In ordering Condition 113 we recognize Cabinet's authority under section 23 to vary this approval in whole or in part. We believe nine years is ample time for all requirements of this approval to be phased in including the timing of revisions to the Timber Management Planning Manual as discussed below.

COMPLIANCE WITH THIS APPROVAL AND TIMBER MANAGEMENT PLANNING MANUAL REVISION

As the statutorily established authority charged with ensuring compliance by a proponent to an approval, MOEE has a particular interest in how MNR will interpret and apply the terms of an approval. MNR is given authority under the *Crown Timber Act* R.S.O. 1980, Chap. 109, s. 33 update) to prescribe the form and content of the Timber Management Planning Manual (TMPM).

The Minister may authorize a manual of management plan requirements prescribing the method of preparing management plans, operating plans, annual plans and inventories, and the form thereof.

The Timber Management Planning Manual is the primary vehicle for implementation of this undertaking.

MOEE told us in final argument that the usual practice in MOEE for class environmental assessments is to amend the Class EA document to incorporate Conditions of Approval, such that an approved Class EA document becomes the controlling document when carrying out the activities included in the Class.

MNR proposes instead that the document to be amended to incorporate the Conditions of Approval should be the TMPM. MNR's proposed Condition 75 would establish a procedure for revising the TMPM to reflect the Conditions of Approval:

75. Within six (6) months of the final approval of this undertaking, MNR shall produce draft revisions to the Timber Management Planning Manual for Crown Lands in Ontario ("TMPM"), incorporating the timber management planning process and plan content requirements described in these Terms and Conditions. Prior to finalization of revisions to the manual, MNR will provide the Director of the Environmental Assessment Branch, Ministry of the Environment and other interested persons with an opportunity to review the draft revisions for consistency with the timber management planning process and plan content requirements described in these Terms and Conditions. Any person who wishes to comment shall provide comments in writing to the Ministry of Natural Resources within three (3) months of receipt of the draft revisions to the TMPM. The Minister of Natural Resources shall consider those comments, and finalize the revisions to the Timber Management Planning Manual within three (3) months thereafter.

MOEE is unhappy with MNR's proposed procedure because it contains no mechanism to resolve disputes among the parties as to whether the Board's conditions are fairly reflected in the only comprehensive document to be used to control timber management in Ontario. MOEE argues that its compliance responsibilities and capabilities will be severely undermined if it is constantly caught up in argument between MNR and those affected by timber management activities – including those contemplating or making bump-up requests – as to whether the TMPM procedures and requirements in fact conform to the Conditions of Approval.

For example, MOEE referred on a number of occasions during the hearing to examples of plan preparation and content that deviated from the requirements of the TMPM (Ex. 911). MOEE argued that MNR's compliance with the TMPM has not always been satisfactory. Issues of compliance with the TMPM, says MOEE, will be difficult enough to resolve,

without adding the additional complication of a continuing debate as to whether the TMPM itself adequately reflects the Board's decision.

In Reply evidence, MNR witness Frank Kennedy made it clear that the whole issue of whether the draft revised TMPM adequately incorporates the Board's terms and conditions was a decision which was to be left entirely to the unrestricted discretion of MNR:

Q. Can I take it from what you have said that you regard the provision to the director of the Environmental Assessment Branch as a requirement that the director of the Environmental Assessment Branch concur with the revisions?

A. No, I would not go so far as to use the word concurrence in this particular term and condition [MNR's proposed Condition 75].

However, in continuing this answer, Mr. Kennedy recognized the need to ensure that the TMPM properly incorporates the Board's decision:

I think it is important that MNR maintain the responsibility to put in place the Timber Management Planning Manual. I think it is important that Ministry of the Environment maintains some distance, if you will, from that final decision as in keeping with the EA process and that MNR has responsibility to do their best to ensure that we have properly incorporated the results of the Board's final terms and conditions into a manual that will serve as the primary tool for providing direction to the field in implementing the terms and conditions related to timber management planning and plan contents.

(trans: vol. 394, p. 67927)

MOEE told us in argument that it agrees that MNR has responsibility to implement the Conditions of Approval, but that MNR has also recognized and endorsed the principle that in ensuring conformance with terms and conditions, the director of the EA Branch has the responsibility – in the words of Mr. Kennedy – "to serve the purpose of safeguarding the public interest" (trans: vol. 394, p. 67926).

MOEE has told us that it:

... cannot fairly be expected to meet this objective in circumstances where its concurrence is neither requested nor required - and where the key decisions, in the end, are entirely within the discretion of the proponent. Equally clear is MNR's unwillingness to extend to the Director of the EA Branch anything

analogous to an approval function as to the adequate incorporation of the terms and conditions into the TPM.

(MOEE final argument, p. 80)

In MOEE's submission,

... this position leaves the Board with only one reasonable course of action – the Board must withhold its final approval on this matter until any potential disputes as to the adequacy of the incorporation of terms and conditions into the TPM are determined by Board order.

emphasis added (MOEE final argument p. 81)

MOEE proposed a process to gauge compliance by MNR with a Class EA decision and its Conditions of Approval. This process would be based entirely on the existing hearing record. This process is set out in MOEE's proposed Condition 75(b) as follows:

75(b) Upon completion of the revised TPM by MNR as provided for in Term and Condition 75(a), parties will have one month within which to make submissions to this hearing panel in the event clarification is required regarding the Board's decision as reflected by MNR in the revised TPM. All submissions shall be in writing and shall set out the specific amendment requested to MNR's revised TPM. No new evidence will be considered by the Board in deciding any dispute that may arise in respect of the TPM, and the Board's consideration shall be strictly limited to issues as to whether the terms and conditions of approval are fairly reflected in the TPM. In the case of any dispute following this process, compliance with the TPM shall constitute compliance with the terms and conditions of approval.

(emphasis added)

MOEE's proposal does not require us to reconvene the hearing as such and explicitly stipulates that no new evidence would be considered by the Board in deciding any dispute. No witnesses will be called and submissions will be limited to written form; to be provided to the Board within one month of the completion of MNR's revision process and the distribution of the final draft revised TPM to the parties.

MOEE submits that such mechanisms have been used in decisions of other hearing panels to address implementation matters, and that such a process is essential to MOEE's ability to carry out its responsibilities in relation to this approval.

We are in agreement with the gist of MOEE's proposal, and are ordering its proposed Condition 75(b) with some important changes as shown in our Condition 90.

We are uncomfortable with MOEE's characterization of this process. We do not see this process as providing "final approval on this matter." Such language muddies exactly when the moment of our decision occurs, and for the purposes of s. 23 of the *Environmental Assessment Act*, this is significant. No party should misapprehend that in our view, the moment of our decision precedes the process set out in this condition. Our involvement beyond that point will be only to provide necessary clarification to the proponent and to individuals who have concerns over the revised TPM and to MOEE – the ministry charged with ensuring compliance to this approval – as it exercises its authority and responsibilities. Furthermore, we are not reconstituting ourselves as a "hearing panel." Our role will be simply to ensure that the TPM revision will be in compliance with this approval.

Furthermore we do not want the TPM to displace the legal weight of the Conditions of Approval upon completion of the process under Condition 90 as the last sentence in MOEE's proposed condition would appear to do. We see merit in continuing to focus upon the Conditions of Approval in order to assess the compliance by the TPM to the terms of the approval. The TPM can be revised by MNR following completion of the process under Condition 90(b) and MNR must continue to be scrutinized to ensure its compliance with the approval. We note that a process exists for amending the approval as required (Condition 112(a) and Appendix 24). This process contemplates the involvement of MOEE if amendment to the Approval is required. The amendment process should also apply to further changes to the TPM but only if such changes fall within the standards listed under Condition 112(a), i.e. to enable the TPM to reflect:

1. clarification or improvement of the timber management planning process and plan content requirements described in these terms and conditions;
2. clarification or improvement of the provisions for monitoring described in these terms and conditions; or
3. extension of the approved undertaking to include new technologies which may become regular operational practice in the future.

MOEE should be aware of and involved in such developments, and in the amendment process. To deem compliance with the TPM to always constitute compliance to the approval, even after subsequent change and revision to the TPM could by-pass the amendment process. This must not happen. For this reason, we have struck the last

sentence from the proposed condition which would deem compliance to the approved TPM to be compliance to the Conditions of Approval. Condition 90 will read as follows:

90. (a) Within six months of the final approval of this undertaking, MNR shall produce draft revisions to the Timber Management Planning Manual for Crown Lands in Ontario ("TMPM"), incorporating the timber management planning process and Plan content requirements described in these terms and conditions. Prior to finalization of revisions to the manual, MNR will provide the Director of the Environmental Assessment Branch, Ministry of Environment and Energy, and other interested persons with an opportunity to review the draft revisions for consistency with the timber management planning process and Plan content requirements described in these terms and conditions. Any person who wishes to comment shall provide comments in writing to the Ministry of Natural Resources within three months of receipt of the draft revisions to the TPM. The Minister of Natural Resources shall consider those comments, and finalize the revisions to the Timber Management Planning Manual within three months thereafter.
- (b) Upon completion of the revised TPM by MNR as provided for in Condition 90(a), parties will have one month within which to make submissions to this hearing panel in the event clarification is required regarding the Board's decision as reflected by MNR in the revised TPM. All submissions shall be in writing and shall set out the specific amendment requested to MNR's revised TPM. No new evidence will be considered by the Board in deciding any dispute that may arise in respect of the TPM, and the Board's consideration shall be strictly limited to issues as to whether the terms and conditions of approval are fairly reflected in the TPM.

Findings

We accept MNR's proposal that its Timber Management Planning Manual be amended to incorporate the Conditions of Approval. We are persuaded of MOEE's concerns about the conformity of the manual's procedures and requirements with the Conditions of Approval and we are ordering a revision process in Condition 90 to address these matters.

CHAPTER 3

TIMBER MANAGEMENT PLANNING PROCESS

INTRODUCTION

This chapter describes the timber management planning process in considerable detail for two reasons: first, because we rely heavily on this process for assurance that timber management can be carried out in Northern Ontario without unacceptable effects on the environment; and second, because this is where we explain how public involvement can shape the decisions being made about our forest resource.

Understanding how the planning process works is also the basis for our discussion of the detailed activities involved in timber management, and how they can be carried out in an acceptable way. That discussion follows in Chapters Four through Seven.

MNR has divided the area of the undertaking into 90 Forest Management Units, as shown on Map 2, and the crucial planning happens at that level. In some cases, certain planning responsibilities have been delegated to forest industry companies under Forest Management Agreements; in others, all the planning is done by MNR employees. But whatever the arrangement, the planning process remains basically the same. A Plan author, who is a forester either from MNR or from a company, works with a planning team, most or all of whose members are MNR staff experts. The Timber Management Plan looks 20 years into the future, where possible, identifying forest stands suitable for harvest and suggesting corridors for roads that will be needed. The Plan is much more detailed in spelling out what activities will be carried out in the upcoming five-year period. The ministry has ultimate responsibility, but we also rely greatly on public involvement to ensure that sound planning takes place.

The public owners of Ontario's forests demand a say in their management. The new timber management planning process acknowledges that the public cannot be shut out of making decisions. The success of the new process is on MNR's shoulders: it must give people the information they ask for if the public is to become "active citizen-participants rather than passive consumers" as the ministry promises in its Directions '90 initiative. We believe the public will become responsible partners with MNR in timber management planning. This

influence will improve decisions about the management of our forest and over time MNR will respect and rely on public advice.

Made in Ontario Solution

Forests and their management elsewhere in Canada, the United States and Europe were discussed at the hearing, but no one proposed simply importing a planning system from another jurisdiction. Our boreal and Great Lakes-St. Lawrence forest do not resemble the rain forest of Brazil or the temperate forest of the West Coast. Unlike Europe's cultured forests, our Crown lands have not been under management for hundreds of years. Northern Ontario's vast woodlands are unlikely ever to see the crowds that pack U.S. National Forests, as 260 million Americans seek recreation. All parties to the hearing agreed that Ontario's timber management planning must be our own invention, tailored to the special features of our forest environment, non-timber users and industry. Even FFT, which proposes a method of integrated forest management similar to what is done in the United States, acknowledges that Ontario should not "adopt wholesale, a planning approach equivalent to that used in the U.S. Forest Service plan." OFIA and the OFAH/NOTOA Coalition contend that Ontario is a leader in timber management planning.

The opinion of the expert witnesses for all the parties convinces us there needs to be room for the professionals to use their judgement in timber management planning. Forest Managers need flexibility and discretion to choose the best approach among the approved silvicultural prescriptions and guides, for example, for reasons such as site variability, new knowledge and their experience in the field. A false sense of confidence would result if we approved an "assembly line" timber management planning process forcing forest managers to abide by rigid rules in situations where their personal knowledge and experience would give better results. We are satisfied that the terms and conditions of our approval involve the public in the decision-making process and document the reasons when exceptions are made to the rules.

"I would hope that the Board does not come down with a number of inflexible rules that are going to tie the forests down for the future," said Crandall Benson, an FFT witness. Forest conditions change, he explained, so that it is "very difficult at any one point in time to write rules that you are going to follow and I don't think the Board is going to be writing the Ten Commandments" (trans: vol. 276, pp. 49638-39).

Timber management planning is expensive. MNR estimated that the direct cost for preparing 11 recent Plans ranged from \$100,000 to \$684,000, with an average of \$319,200

(Ex. 2251A, Board Interrogatory 164). MNR also estimated that the proposals contained in its January 1992 draft terms and conditions would cost the taxpayers an additional \$56 million a year. The conditions of our approval are bound to increase the cost still more, although we have taken care not to inflict unwarranted expense on the government or industry.

Does supplying timber to industry in a way that protects the forest environment justify this expense to the public purse? We are convinced that the costs are necessary.

Schedule for Producing a Timber Management Plan

Timber management planning takes time to do properly and no short cuts can be taken to avoid the detailed preparations and public consultation required by our approval. We estimate that approximately 27 months would be needed from the first invitation to participate until the beginning of field operations. This means that planning for the 1997-2002 period, for example, begins midway through the existing 1992-1997 Plan. The schedule of activities for producing, reviewing and approving timber management plans is shown in Figure 3.1, which is also Figure 1 on p. 468 in the Conditions of Approval.

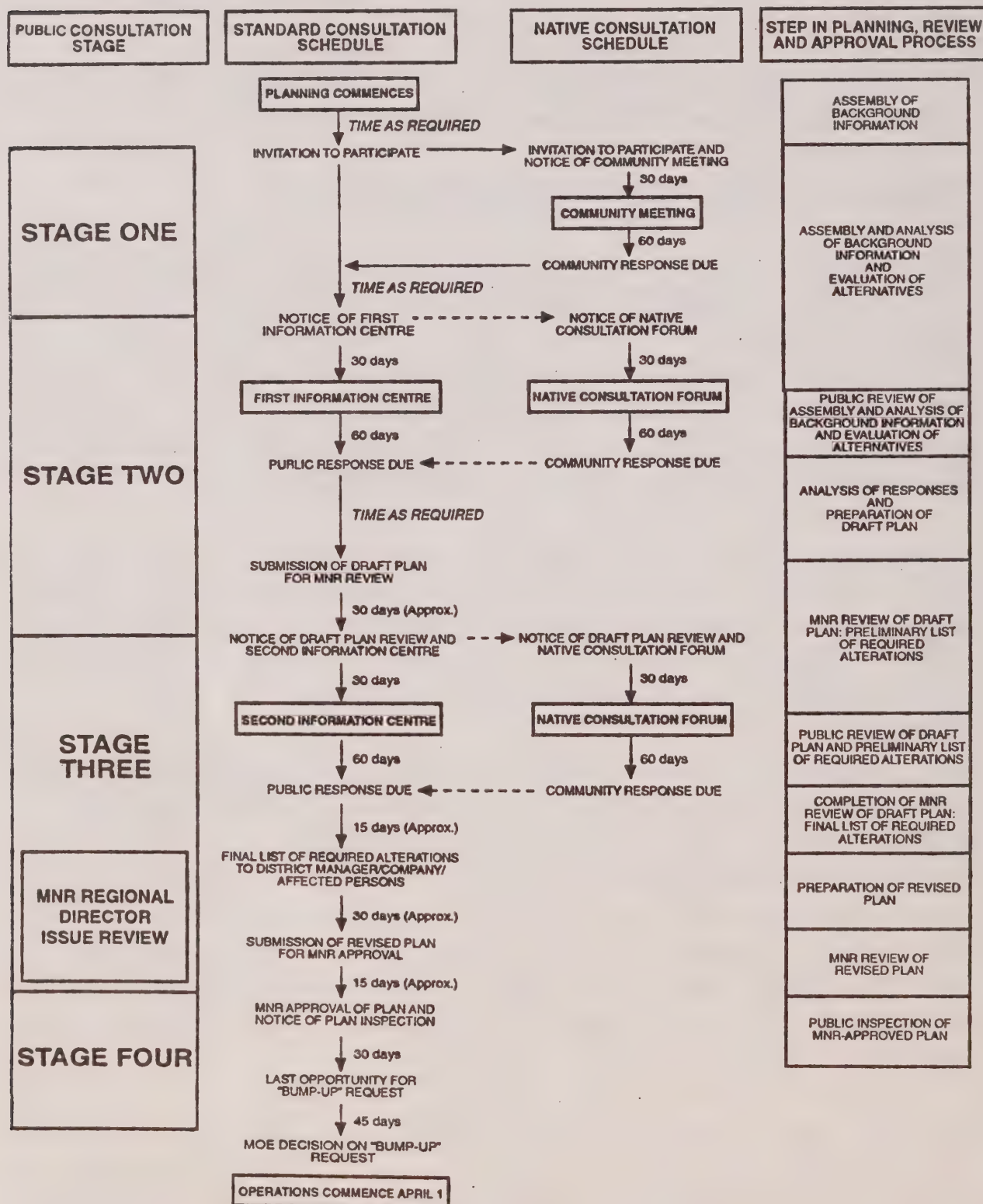
This schedule is intended to ensure that planning always begins early enough that it will certainly be completed by the deadline. We allow for contingency plans in case unforeseen emergencies prevent completion of a Plan on time, but this should be very rare. Normally, Plans are scheduled for renewal every five years, but Condition 68 allows an unscheduled renewal if unexpected events make the Plan suddenly obsolete.

The planning process identifies areas suitable for roads, logging, regeneration and tending for 20 years as well as a detailed Plan for the first five years. Each year's activity is then spelled out in an Annual Work Schedule. The 20-year planning horizon confuses the public and makes them feel the need to be vigilant always of what "MNR is up to." We received complaints from people who thought they reached agreement with MNR not to harvest a particular area, for example, only to have the issue reopened in a subsequent five-year Timber Management Plan. MNR's position is that deferring operations does not permanently remove an eligible area from being harvested in the future (see p. 148 of Chapter 5).

The public needs to understand that the 20-year planning for eligible areas gives predictability to timber management operations over the long term. For example, the identification of a primary road corridor will lead to harvesting the timber accessible from

Figure 3.1

SCHEDULE: TIMBER MANAGEMENT PLAN PRODUCTION, REVIEW AND APPROVAL



that road. Decisions made in each Timber Management Plan map out the directions of operations over the long term and for this reason are not easily reversible.

Timber Management Planning is MNR's Responsibility

The actual work of building roads, logging, regeneration and maintenance is done by companies or persons under licence, FMAs or contracts but the *Crown Timber Act* requires the Ministry of Natural Resources to review and approve all Timber Management Plans (*Crown Timber Act*, 1990, Chap. C. 51, s. 26(3)).

We cannot accept the proposals of some intervenors that the public replace MNR as a final decision maker in timber management planning. Our approval makes the public better able to influence MNR's decisions, but it is our view that the public servants given the legislative authority for timber management planning must make the decisions. MNR has the expertise to do timber management planning that the public lacks and MNR can be held accountable for its decisions. The public also is not in a position to determine how much timber is needed from a particular unit. If MNR ignores what the public wants done with our forest, we are confident that our approval will reveal this unacceptable management. Then the Minister of Environment and Energy will be in a better position to consider whether to extend the approval pursuant to Condition 114.

WHO DOES TIMBER MANAGEMENT PLANNING?

The Plan Author and Planning Team

OFIA persuaded us that the only true method of achieving accountability in timber management planning is to have a clearly identified and designated Plan author who is responsible for the contents of the Plan and on the front line for resolving disputes with the public during the two-year planning process. Conditions 1, 2 and 3 and Appendix 5 describe how the Plan author and the planning team will work.

We require the Plan author to be a Registered Professional Forester. We disagree with MNR's proposal for Timber Management Plans, amendments and contingency plans to be prepared "under the supervision" and certification of a Registered Professional Forester, in accordance with the *Crown Timber Act*, R.S.O. 1980, c. 109. We received evidence from more than 50 foresters persuading us that their education, professional training and experience qualify them to be competent managers of our forest. We are requiring the Plan author to assemble and analyze technical forestry data such as the Maximum Allowable

Depletion calculation, silvicultural ground rules and operational prescriptions; this work demands the specialized training of foresters.

Even though many Plan authors will be employed by private companies, they must operate under the direct supervision of the MNR district manager. The district manager selects the members of the planning team, including the Plan author, and names the team's advisers. For Forest Management Agreement units and Company Management Units, the Plan author will be a company employee, chosen by the company. The district manager and regional director have the final say in approving the Plans prepared by the authors (Conditions 61 and 63). To give an additional guarantee of MNR supervision and responsibility, an MNR forester will be a member of all planning teams for company prepared plans (Condition 3(c)).

We accept OFIA's proposal that the Plan author chair the planning team as one more way of achieving accountability for the Plan and a readily identifiable contact for the public.

We disagree with OFIA's proposal for a local technical committee that would relegate the timber management planning team to a loose grouping of experts consulted individually by the Plan author. We are approving terms and conditions requiring the Plan author to represent the other planning team members, to work closely as part of the team but take responsibility as the public face and voice of the planning team in dealing with the Local Citizens Committee and with the public informally, at information centres and in solving disputes.

We accept OPFA's proposals that a Registered Professional Forester (RPF) prepare Timber Management Plans, amendments and Contingency Plans (Conditions 3, 60) and develop the silvicultural ground rules for each Plan (Condition 20(a)). Registered Professional Foresters are members of the Ontario Professional Foresters' Association (OPFA) who meet certain levels of training and education and who practise forestry by a professional code of ethics and professional standards of forestry. The standards are now in the process of being codified. John Ebbs, OPFA's Executive Director, proposes that Registered Professional Foresters be involved in almost all aspects of timber management planning because their responsibility includes a "duty to the forest itself and provide a level of accountability beyond that required by an employer or land owner" (Ex. 1804, p. 6). We are also convinced, as proposed by OPFA, that some involvement by Registered Professional Foresters is needed to do independent audits.

The OPFA asked for our assistance in trying to reconstitute itself "as a licensing or right-to-practise type of self-governing profession." If it achieves this goal "the practice of forestry

will be defined such that those engaged ... must be Registered Professional Foresters and therefore subject to the ... OPFA" (Ex. 1804, p. 19). Of the estimated 1,000 foresters (with the equivalent of a university forestry degree) active in Ontario, 30% do not belong to the association. How the OPFA and professional foresters choose to organize themselves in the future is outside our approval.

Conditions 2 and 3(a) speak to the importance of "interdisciplinary" planning teams whose members are experts in non-timber and timber matters. The Ministry of Environment and Energy and MNR reached an agreement that will allow MOEE staff to attend planning team meetings, receive documents and participate in meetings, but not be members of the team or advisers to avoid any conflict of interest in case there is a bump-up request (trans: vol. 153, pp. 26481-88). The names of all planning team members, advisers, experts and reviewers and Local Citizens Committee members will be shown at the first public information centre and in the Plan.

Will the foresters on the planning team dominate so that the non-timber interests represented by biologists and socio-economists, for example, always lose out to supplying timber? Our terms and conditions give equal footing to all planning team members: significant disagreements among planning team members will be recorded in a Plan's supplementary documentation (Appendix 9, section 1(a)). The district manager is the final arbiter of disagreements (Condition 62(b)(i)), not the Plan author or other planning team members and we believe this reinforces MNR's ultimate responsibility for the Plan better than the OFAH's proposal that the planning teams settle disputes by vote. Planning team decisions that do not conform with the implementation manuals will be documented as "exceptions" in the Plan with a rationale given (Condition 42(c)) and the Plan will include provisions for monitoring the results (Condition 55). The Local Citizens Committee will be represented at planning team meetings to witness disagreements and make any comment they wish in their recommendations, which will also be published in the Plan's supplementary documentation (Appendix 9, section 1(f)).

We believe that the appointment of one Local Citizens Committee member to the planning team and the opportunity for all LCC members to sit in on meetings as they wish are the most important means we have found of opening up the planning team deliberations to public scrutiny and giving the public direct influence on the development of the Plan. For this reason, we require that each LCC appoint one of its members to the planning team or explain in their recommendations why it did not. If the LCCs' participation on the planning team does not work, we are pessimistic that a better answer can be found to the public's demand to be directly involved in deciding and producing the Plan.

Local Citizens Committee

People who live and work in the area or otherwise have a direct "local" interest in the Plan will serve on the Local Citizens Committee. We agree with Northwatch's proposal that MNR request nomination of members from interested groups where possible rather than leaving the choice entirely to the discretion of the district manager, risking the perception that LCC members are "handpicked" by MNR (Appendix 1, part D, section 1). Once established, the committees should be permanent institutions, offering public input to all timber management issues as they arise. There shall be at least one LCC for each district and, where needed, one for every management unit. Each LCC will be most active, of course, during the planning process every five years, but it should not go dormant between planning cycles. We have not specified length of terms for members of the LCCs, but the benefit of experienced members is obvious and we hope most members will serve during the development and implementation of at least one Plan.

The LCC is being asked to do many things, all in an attempt to get the interest of the local community recognized and dealt with in timber management planning. Except for the important decision-making involvement of the LCC member on the planning team as discussed previously, the committee's role is as an "adviser" to the district manager. We could not accept the proposal by CASIT and the OFAH/NOTOA Coalition that the LCC should have equivalent authority to or in some way rival the decision-making responsibilities of the planning team or the district manager (trans: vol. 347, pp. 60488-524). MNR must make the final decisions so that Plans are technically sound and meet overall provincial objectives. We strongly believe, however, that under the conditions of our approval the district manager will not ignore or reject, without credible reasons, the recommendations of the LCC.

We believe that the LCC is in the best position to recommend to the district managers how to involve the public in their area. The committee will do important work by gathering background information, taking part in the development of the objectives of the Plan and the values maps, assisting in monitoring the Plan's implementation and providing advice to the district manager on decisions about amendments and bump-ups. In Chapter 7, we discuss the representation of the LCC in planning insect pest management projects.

We are cautious about the expectation that LCCs will win consensus among all the interests involved in timber management planning. The interests of a remote tourist operator who needs the remoteness of his or her location will always conflict with the demand for access to the same lake by anglers. But we believe there is a better chance to find a solution if

these interests are represented on the LCC where everyone is given full information and views are debated around the table. We also believe the group problem solving approach of the LCC will keep the process from being "hijacked" by special interest groups, a concern expressed to us at the community hearings.

MNR agreed to reimburse LCC members for reasonable out of pocket expenses but opposed any payment for their time. The only evidence we received was from Charles Alexander, then president of the OFAH, who estimated that he lost \$15,000 of income in one year because of his time spent on timber management planning activities. If we use his example, the cost of compensating LCC members would be prohibitively expensive, but we believe his involvement was uniquely demanding and much more than would normally be required by an individual LCC member. We are ordering MNR to compensate only the designated LCC member of the planning team, on the basis of what MNR considers to be a reasonable per diem, for attending planning team meetings that cannot be scheduled outside that person's working hours (Appendix 1, part D, section 5). In our view we cannot afford failure of the LCCs at the beginning because the time required of their most heavily involved members becomes too much of a personal sacrifice.

MNR will give the LCC any information or secretarial support that the district manager decides is necessary and reasonable (Appendix 1, part D, section 5). We believe this addresses some of the OFAH/NOTOA Coalition's concerns that the LCCs must be given resources if they are to do the work the planning process needs.

We want to make sure the LCCs' views and recommendations receive prominent attention. The first page of every Plan shall record the committee's general agreement or disagreement with the contents of the Plan (Appendix 1, part D, section (6)(b)). Also, the LCC will prepare a summary report of its activities, including the problems they studied and their recommendations. This report will be part of the supplementary documentation of the Plan and part of the three Plan summaries distributed during the public consultation process. The LCC will also be consulted and have its views recorded concerning Plan amendments, the issue resolution process, bump-up requests and independent audits. At the end of our approval, MNR will report to MOEE on the success and failure of public consultation, including the LCCs. In these ways, there will be disclosure of any situation where the district manager or planning team refuses to work productively with the LCC, and this will be on record as an issue of public accountability.

General Public

The Local Citizens Committee will improve, not replace, the participation of the "general" public in timber management planning. The public not involved in the LCC will have opportunities to attend information centres (Conditions 10 and 11) and to contribute to the mapping of values for considerations in the Plan (Condition 17). In addition, the planning team is required to "make diligent efforts to ensure on-going public participation" and the planning team and the LCC will meet with interested members of the public on request at any time during the planning process (Condition 7) and respond in writing to public comment and submissions (Condition 14). Anyone may request a bump-up and have recourse to the issue resolution process (Conditions 64 and 70).

First Nations and Aboriginal Peoples

The role of First Nations and Aboriginal peoples in timber management was among the most important and complex issues at this hearing. We are ordering conditions intended to provide these communities a guaranteed opportunity to participate in the planning process and a better chance to share in the benefits. All these matters, including our conditions setting out a new Timber Management Native Consultation Process, are the subject of Chapter 10 of this decision.

Committees

Timber management planning cannot be done for local forests, independent of regional and provincial objectives. Provincial interests need to be translated into regional objectives and the implications must be considered for each of the 90 Forest Management Units. MNR has organized itself to operate at three management levels but the forest users have not been formally involved regionally or provincially. We are convinced that involving these user groups is essential and will improve timber management planning.

OFIA proposed the creation of a Provincial Policy Committee and a Regional Integrated Users Committee. We have renamed the second panel the "Regional Advisory Committee." We accept OFIA's argument that these committees should serve in an advisory capacity to the minister and deputy minister and regional directors and we order their formation in Condition 4:

4. (a) **The Ministry of Natural Resources shall establish a structure of committees to review, advise, guide and improve the timber management planning process**

and to increase the level of public input to and public scrutiny of timber management planning in the province.

- (i) In addition to the public consultation provisions set out in Conditions 8 to 12, a number of local citizens representing a range and balance of interests shall be afforded expanded opportunities to participate in the timber management planning process through membership in a Local Citizens Committee (LCC). MNR shall establish at least one LCC for each district and where needed, one for every management unit in the Area of the Undertaking.
 - (ii) At the regional level, MNR shall establish Regional Advisory Committees (RAC) to provide advice in translating provincial goals into regional objectives. These committees will also provide scrutiny to the progress in achieving management unit, district and regional objectives.
 - (iii) At the provincial level, a Provincial Technical Committee (PTC) shall be established. This committee will review and update technical guidelines, construction/operational manuals, and resource/environmental manuals related to the management of timber and non timber resources. (See Condition 89)
 - (iv) At the provincial level, a senior-level Provincial Policy Committee (PPC) shall be established. This committee will review and provide guidance on provincial resource management goals, objectives, targets and strategies. It will also advise on the development of associated provincial policies to outline the broad goals of other ministries and of the government as a whole.
- (b) The composition and terms of reference of the senior Provincial Policy Committee, the Provincial Technical Committee, the Regional Advisory Committee and the Local Citizens Committee are described in Appendix 1.

Ministry of Natural Resources

We heard much evidence about MNR's administrative and managerial ability to produce the timber management planning results expected by the public, who hold MNR responsible for the failure or success of timber management planning.

We conclude from the evidence we heard that the district managers working in the area of the undertaking are the "front-line" group whose management of the timber resource will most directly determine its failure or success. The district managers are responsible for the successful functioning of the planning teams and the LCCs, for meeting the regional and

provincial timber management planning objectives, for finding satisfactory solutions to the concerns and complaints of the public and for recommending approval of the Plans.

The four regional directors are less involved than the district managers in the day-to-day conduct of timber management planning. But their involvement is critical in final approval of the Plan and any major amendments to it (Condition 63, Appendix 13) and in making final decisions about issue resolution before a bump-up request is decided by the Minister of Environment and Energy. We believe the decision making authority of the regional directors is appropriate and necessary to provide the link between timber management planning in the forest management unit and provincial interests.

Ministry of Environment and Energy

The Ministry of Environment and Energy is an important participant in timber management planning. It is the agent we are relying on to satisfy the public that the Ministry of Natural Resources is complying with the terms and conditions of the Class EA approval. Represented as a full-time party to the hearing, the Ministry of Environment and Energy recommended acceptance of the Class Environmental Assessment and approval of the timber management planning undertaking subject to terms and conditions.

As discussed in Chapter 8, our Condition 114 requires MOEE to decide at the conclusion of the term of our approval how to exercise its authority to exempt an undertaking from the requirements of the Act in order to extend this approval, with or without amendment, or possibly to revoke it by denying further approval. Over the coming nine years, we believe MOEE must be actively involved in timber management planning to ensure MNR's compliance with the numerous conditions of our approval and to be in a position from first-hand experience and vigilance to make a well-informed decision about extending the approval.

The parties agreed to many conditions that will keep MOEE in a "watchdog" role over the parts of timber management planning that relate to environmental assessment. In addition to these conditions, MOEE has recourse under the *Environmental Assessment Act* to require MNR's compliance with the conditions of our approval. All this is discussed in more detail in Chapter 2. The public has a right to expect the Ministry of Environment and Energy to be a major, on-going presence in timber management planning: the province made a huge investment in bringing the first Class EA approval to a public hearing and the protection of our forest environment demands vigilance.

HOW CAN THE PUBLIC INFLUENCE TIMBER MANAGEMENT PLANNING?

Timber management planning is too large and complicated to be a quick study. The public can be educated in timber management only by being in the planning process. The forest knowledge of the hundreds of "non-experts," especially northern Ontario residents we heard from at the hearing, was impressive. If they do not sit on the Local Citizens Committees or go to information centres or make their opinions known in the other ways we provide, the four-stage consultation process we are approving will fail. The same holds true for environmentalists in the south, whose continued activism is essential.

Public Notice

The first step is to tell the public what is happening. We accept the parties' negotiated agreement about who should receive notice and its timing and contents, although to the uninitiated this seems to be an endless stream of mailed and newspaper notices for information centres, timber management and contingency plans, amendments, insect pest management programs, annual work schedules, prescribed burns and aerial spray of herbicides and insecticides.

Condition 5 requires MNR to produce by January 31 each year a list of all Plans currently being prepared and those expected to begin that year. (This is also in the annual report to the Legislature (Appendix 20, 1(1)) We require MNR to give its best estimate of when new Plans will be started to satisfy OFIA's concern that Plans will not be completed by April 1 (two years after issuing the invitation to participate). This list is the simplest reference available to people, especially those in southern Ontario, who wish to follow the status of Plans. It is the first indication that the process is starting for a new Plan and it will be provided on request and widely distributed in MNR and MOEE offices across Ontario.

MNR will attempt to notify people who are not on the mailing list through advertisements published in the local media (Condition 6 and Appendices 2 and 3). MNR promises to write such notices in "concise non-technical language" and we must rely on the public over time becoming comfortable and familiar with this communication.

Public Consultation

We accept the parties' agreement on a four-stage public consultation program for developing a Plan and we order this in Conditions 7 through 12. The program covers four notices to

be given by the MNR district manager and two information centres that take place while a Plan is developed from background information to a final approved version over approximately two years as shown in Figure 3.1. We agree that the public must be invited into the process long before a draft Plan exists.

Some people complained to us about information centres, describing the experience as a "smoke and mirrors" selling job by MNR that pretends to solicit meaningful input from the public but is a waste of time. No better solution than information centres was proposed to us and we are optimistic that the public can bring pressure on MNR to improve the "open house" format as new ideas come with experience, such as question-and-answer sessions for the public, as Coalition witness Suzanne Dubé-Veilleux suggested. In the event that information centres do not meet our expectations, other provisions such as the role of the LCCs and the onus on planning teams to communicate with the public throughout the planning process (Condition 7) should ensure that effective public consultation will occur. Successful public consultation is essential to our approval of timber management planning and, as mentioned above, we are ordering in Condition 114 that the Minister of Environment and Energy specifically review experience with LCCs, information centres and other provisions for public consultation in making any decision about extending our approval.

Stage 1: Invitation to Participate

The public will be told in the annual list described above that a Plan will be developed for a Forest Management Unit but the planning process is not officially started until the invitation to participate is issued. The invitation describes how the planning process will work and offers everyone the opportunity to go to the MNR District Office and see the background information that will be used to prepare the Plan, such as the basis of the values map, updating the Forest Resource Inventory, results of preliminary analysis from the draft Report on Past Forest Operations and timber supply.

Timber management is a continuous process. Planning teams do not start at "square one" with each five-year Plan and the team must collect much background information before the invitation for the public to participate is issued.

Stage 2: First Information Centre

Within several months of the invitation to participate, notice will be issued to announce the first information centre. Its purpose is to get public comment on the planning team's

assembly and analysis of background information and evaluation of alternatives. The information available for the public to review at this information centre includes the Report of Past Forest Operations, the planning team's suggestions for management strategies, 20-year eligibility and five-year selection criteria and values maps.

Stage 3: Second Information Centre

The planning team prepares the draft Plan based in part on their analyses of public responses from the first information centre. They present the draft Plan to MNR's reviewers who give a preliminary list of required alterations. After a 30-day public notice, the second information centre is held to present the draft Plan and preliminary list of required alterations. Figure 3.1 shows that the public has 60 days to comment to MNR following the second information centre. MNR then finalizes its review of the Plan, the planning team reworks the draft Plan and submits it for MNR's approval.

Stage 4: Notice of Approved Plan Inspection

Once MNR has approved the Plan, the public is invited to inspect the final Plan and supplementary documentation at the same locations where the draft Plan was available: MNR's district and appropriate regional offices, a Toronto location provided by MNR and the appropriate MOEE regional office. This notice will be given at least 75 days before the April 1 deadline for operations in the Plan to begin, because for 30 days following the inspection notice the public has a last chance to request the Minister of Environment and Energy for a bump-up and the minister will respond to a request within 45 days. We discuss the bump-up provision on p. 106.

Area of Concern Planning

Timber management is unacceptable to the public unless the planning process will protect the non-timber values and resources of the forest. MNR's solution is Area of Concern (AOC) planning, a special process within timber management planning to protect forest values. We agree with MNR's approach.

The first step is to map site-specific features to be protected. These might include such things as fish spawning areas, eagle and osprey nests, tourist lodges, traplines and areas of significance to local communities for traditional and recreational activities. In Appendix 5 there is a long list of the types of values or information that will normally be included on these "values maps." These values become Areas of Concern if they might be affected by

timber management operations in the five-year Plan. Condition 41 requires each Plan to show the measures to be taken, or "prescription," to protect each Area of Concern. One example of how concerns about non-timber values can be handled smoothly, and apparently to general satisfaction, can be found in the testimony of Judy Daschuk at the Timmins community hearing (trans: vol. 234, pp. 42610-11).

How many values are typically found on a map? OFIA witness Michael Innes estimated there could be 600 to 1,000 or more values identified for a forest management unit (trans: vol. 191, p. 33782) and we were told that 1,100 were identified in the Dog River-Mattawan unit (trans: vol. 226, p. 41147). We agree with the prediction of Dale Munro, a witness for OFIA, that the number of values identified will increase as public participation in timber management planning grows. In fact, we are relying on the public to identify and report values, because MNR cannot possibly survey the vast forests of Northern Ontario.

OFIA raised the practical concern that the Area of Concern planning process is unmanageable if the documentation requirements are not streamlined. MNR responded during the hearing with a new direction to the field staff to improve the process for documenting Areas of Concern (Ex. 844 and Ex. 1028). MNR's position is that most values are related to the protection of water quality – in the Dog River-Mattawan FMA, 732 values were related to water – and, therefore, common or similar values can be grouped into areas of concern and addressed more efficiently together. A second change made by MNR is to require only minimal documentation where the protection of a value is already provided for in an implementation manual. For example, if a moose aquatic feeding site is involved, MNR asks why efforts should be made to analyze and document alternative measures for protection when the moose habitat guidelines already prescribe a reserve of 120 metres as the satisfactory protection in the situation. Condition 42 permits this streamlining of the Area of Concern process, while Condition 43 requires that if appropriate prescriptions are not found in the implementation manuals, these will be evaluated in detail and the reasons for their selection reported.

What happens if people disagree with the prescription that is selected to protect the value? If the implementation manual, such as the Tourism Guidelines, requires consultation in developing prescriptions, then the Plan must record any disagreement by directly affected parties (Condition 44). John McNichol for MNR gave the example of a tourist outfitter who proposes a 300-metre buffer as the best prescription to protect his operation from noise, while the forest company argues that seasonal restrictions (e.g. logging during the tourist operator's off-season) will achieve the same result. One of these prescriptions could be selected by the Plan author and the dissatisfied parties' non-concurrence would be recorded. With the selection of a prescription, the Area of Concern planning process is concluded, but

parties who have complaints with the outcome will have an opportunity under Condition 64 to enter an issue resolution process. If still not satisfied, they can request a "bump-up," as discussed on p. 106.

We have considered the Area of Concern planning proposals from OFIA, who argue that MNR's approach is unnecessarily burdensome, and from FFT and the Coalition, who believe that it requires too little analysis and documentation. We do not accept OFIA's proposal for identification of "areas containing recognized values" because it does not provide a satisfactory solution to protecting values where appropriate prescriptions do not exist in implementation manuals. We disagree with FFT's view that only the prescriptions in the Fish Habitat Guidelines, among the implementation manuals, are strict and specific enough to rely upon. The Coalition proposed that documentation for Area of Concern prescriptions which are exceptions or alternatives to those found in implementation manuals should include "an explicit quantitative analysis of the environmental costs and benefits and the trade-off involved in the decision." We believe this type of analysis would be difficult to produce in many situations that defy quantification, such as the example given of the tourist outfitter's concern about noise, and we are persuaded that Condition 43 requires sufficient documentation for alternative prescriptions.

We conclude that MNR's proposals, as reflected in Conditions 41 to 44, involve the public in identifying values and in determining prescriptions, that alternative prescriptions will be adequately analyzed where solutions to protecting values are not found in implementation manuals or not used if they exist, and all decisions about Areas of Concern will be reported in the Plan in a way that the public can follow and understand. Specific requirements for monitoring the implementation of prescriptions for Areas of Concern and their success in protecting values are found in Condition 55(a) (see p. 295).

Information the Public Can Understand

The public told us over and over again that they are intimidated by the studies, reports, statistics, analyses – generally the "paper" produced during timber management planning. "How can a lay person be expected to attend and participate in such a forum where the reams of material and the technical jargon is beyond their comprehension?" asked witness Jack Hedman at the Fort Frances community hearing (trans: vol. 205, p. 36660). The public consultation process will fail unless people are given a "shortcut" to the essential facts they need to know about a Plan. For this reason we are ordering the following conditions that require MNR to summarize and highlight timber management information for the public.

Plan Summaries for the Public

The parties agree that the Plan author will prepare an "executive summary" for the public to take home from the information centres. Our conditions require three Plan summaries, none of which should be longer than 10 pages. We believe the three summaries combined give the public a satisfactory insight into the most important elements of the Plan – its background sources, draft and approved versions and the support or opposition of the Local Citizens Committee. The first is the Preliminary Plan Summary to be distributed at the First Information Centre. Its contents are described in Condition 10(a) and Appendix 4, part A, section 2(a). The second summary will be available at the Second Information Centre, and it is the Draft Plan Summary. (See Condition 11(a), Condition 58, Appendix 4, part A, section 3(a)(iv) and Appendix 11.) The third is the Approved Plan Summary and it is available with the Notice of Plan Inspection (Condition 12, Appendix 4, part A, section 4(b), Condition 58 and Appendix 11).

Maps

Everyone at the hearing agreed with OFIA's description of maps as the "most powerful communication tool" available in timber management planning. The public cannot be expected to read and understand the huge and technical documentation in the Plan. We would find it unacceptable for a member of the public with a question about the Plan to be directed by MNR to look in the supplementary documentation, which was six binders of over 500 pages of material in the Red Lake Plan (Ex. 814). We believe that effective public consultation requires the most important information in the Plan – where and when timber operations will be carried out and what values are to be protected – to be clearly shown on maps and we are ordering conditions to achieve this purpose. Nearly all these maps are presented to the public in the first two stages of consultation. Condition 13 identifies which maps are available at each of the four stages.

Stage 1: Invitation to Participate

The public will receive a map of the Forest Management Unit for which the Plan will be prepared in the notice (Appendix 3, part A, section 1(a)(ii)) and in the Plan summary (Appendix 11, section 1(a)).

The public will see the current version of the values maps at the district office (Condition 29 and Appendix 4, part A, section 1(a)(i)) as discussed above. Native communities will see

the current version of the native values maps in the draft Native Background Information Report (Appendix 6, section 1(c) and Appendix 10, section 1(b)).

The public will see the eligibility maps at the district office (Condition 29 and Appendix 4, part A, section 1(b)(v)). These maps show all locations in the forest management unit that MNR has already decided are eligible for harvest, renewal and tending during the 20 years of the Plan, based on eligibility criteria that are discussed on p. 146. This is a first indication the public will have that timber operations over the long term are being planned at locations that might affect their interests. The selected primary road corridors will be clearly defined on the eligibility maps (Condition 30(b)). The process of selecting the routes of future road building and particularly, the implications this has for selecting future logging areas, is discussed on p. 135. We received as Ex. 2216(A) an eligibility map for the 1989-2010 Brightsand FMA Plan.

Most of the maps submitted to our hearing, unfortunately, present such a baffling patchwork of colours and cross-hatching that only professionals are likely to get much out of looking at them. We are ordering in Condition 13 that MNR produce maps easily understood by the public. The increased use of the computerized geographical information systems (GIS) will enable MNR to improve the standardized mapping capability.

Stage 2: First Information Centre

We think that the First Information Centre is particularly important because it gives the public an opportunity to influence timber operations before MNR decides what to include in the draft Plan. For this reason, we believe the public needs a map of proposed operations in a summary "take-home" form. MNR, FFT and MOEE had separate proposals for the contents of the summary map to be available at the First Information Centre. We have accepted all three proposals as we describe in the following. We are leaving it to the discretion of the Plan author to decide how many summary maps are needed to satisfy Condition 18, Condition 34 and Appendix 3, part A, section 2(a)(v). Ideally, all this information would be contained on one map but if it would be too crowded, several maps will be necessary.

The public will learn from the notice that a mapped summary of the proposed areas for operations for the five-year Plan, including alternative road corridors, can be obtained from the district office (Appendix 3, part A, section 2(a)(v), Appendix 4, part A, section 2(k) and this map will be available in the Preliminary Plan Summary for the public to take home. The information on this map is taken from the preliminary "areas selected for operations

maps" discussed below. MNR promises to produce the summary map at a scale that will make it easy to create and to understand.

We accept the proposals of FFT and Northwatch that a mapped summary should also show past harvests and we are ordering this in Condition 18. We are requiring the first set of new Plans to have a summary map showing harvest operations from the two past Plans but the district manager can use his discretion if complete information is not available. We do not accept MNR's objection that mapping past harvest areas will make a map too crowded, that the information is available in other sources any way and that it is premature to do so until MNR completes its investigation of landscape management. The public is concerned about the "contiguity" or the amount of forest left uncut to separate the individual clearcuts and this can only be done by comparing past cutovers with proposed harvest areas. We believe it is important to show past harvest areas because the five-year Plan is not isolated from the timber operations that preceded it or will follow. This summary map will also be available for the public to take home.

We are also requiring a mapped summary ranking the areas meeting the selection criteria for harvest in Condition 34 as proposed by the MOEE. Again, this map will be available for the public to take home. We discuss the importance of giving the public an opportunity to comment on the location of harvest areas in Chapter 5, p. 147.

At the first information centre, the public will also see the preliminary areas selected for operations maps (Condition 32 and Appendix 4, part A, section 2(h)) which are a subset of the areas MNR identified as being eligible for operations over the 20-year period. Here they are further refined as those areas MNR has selected for harvest, renewal and tending during the five-year Plan. The selection criteria used by MNR are discussed on p. 146. MNR gave us, as an example, an "areas selected for operations maps" for the 1989-95 Brightsand FMA Plan (Ex. 2216(B)).

We agree with OFIA's proposal that the selected prescriptions for Areas of Concern should be shown on the five-year preliminary areas selected for operations maps wherever possible and Condition 41(b) provides for this. OFIA argues that mapping the prescriptions instead of only listing them in the supplementary documentation makes it easier for field staff to implement the prescriptions. We support this approach where it can be done, because we believe the Area of Concern process could go to waste if a prescription such as a no-cut reserve is improperly carried out in the field. But we also understand this mapping will not always be possible.

Stage 3: Second Information Centre and Stage 4: Approved Plan Inspection

At these stages, updated versions of all the maps are prepared, as needed. Most important, Condition 58 and Appendix 11 provide for summaries of the draft and approved Plans, including maps for the public to take home.

Other Maps

The public will also see maps for timber operations that occur after approval of the Plan. Notices for Contingency Plans, amendments, Annual Work Schedules and insect pest management programs will include a map of the forest management unit and for the latter two, maps of the scheduled operations or treatment areas (Appendices 3, 4).

Timber Management Planning Brochure

The parties agreed that MNR will prepare a "citizens' guide" describing timber management planning in simple language. It will tell how the public can get involved, provide a glossary of commonly used timber management terms and give an explanation of the bump-up process. The brochure will be available (also in French and native languages) within one year of our approval. We are ordering the production of this brochure in Condition 91 in the belief that it will help educate the lay person about the complicated subject of timber management planning.

Statement on Timber Objectives

MNR proposes to put in the Plan a clear statement of timber objectives to discuss the related problems and issues considered and to describe the strategies which address the timber objectives, problems and issues. MNR gave us what they described as a good example of a statement on timber objectives from the Red Lake Plan (Ex. 814, pp. 31-33). One of the major objectives was to supply 40,000 to 50,000 cubic metres of sawlog material annually over the five-year Plan, of which 20,000 cubic metres was to be used by local mines, particularly the black spruce suitable for mine timbers. A seven-part strategy – including one item to encourage sawmill owners to use smaller diameter wood so they could use more of the timber available to them for sawlogs – was developed to achieve the objective. We find such a statement to be a straightforward means of fully informing the public of the timber requirements in the Plan.

FFT and the Coalition proposed that the timber objectives be expressed in "measurable" terms. We disagree with the Coalition that there will be "measurable, quantified objectives over the next rotation of the forest for timber supply" because we found it unrealistic to forecast a numerical target for timber over 100 years. We are persuaded by FFT, the Coalition and MNR's own example of the Red Lake Plan that timber supply objectives can and should be shown in numerical terms wherever possible and we are ordering this in Condition 22(b).

Statement on Non-Timber Values

Should timber management planning be used as the planning mechanism to develop and achieve the objectives of non-timber values? The parties have opposing views on this question. OFIA took the position that non-timber resources, while they are considered in timber management planning, are better managed by other programs and said it would be misleading to suggest that timber management is a vehicle for managing all forest values (trans: vol. 219, p. 39594; Ex. 1272; Answer to MNR Interrogatory 1(b)). FFT and the Coalition took the opposite view. FFT proposed that timber management planning be used to develop measurable management objectives for non-timber values now but eventually be replaced by an integrated forest management planning process in which measurable goals and objectives are established for both timber and non-timber resources, guided by the principles of maintaining biological diversity and landscape planning and management. We discuss FFT's integrated forest management planning proposal in Chapter 11, p. 379. The Coalition proposed that all timber management plans contain "measurable, quantified objectives over the next rotation of the forest" for populations of featured wildlife species, habitat for wildlife, biological diversity, recreation opportunities (such as hunting, fishing, canoeing, viewing and aesthetics) and other non-wood products such as baitfish and animals for trapping. The Coalition also said the ultimate objectives of the Plan should be "to strive for an optimum mix of resource benefits" for the forest. This is related to the concept of forest management, discussed in Chapter 11.

MNR's position on the significance of identifying the objectives and strategies for non-timber values in the Plan is consistent with the view that the management of other forest resources is neither timber management planning nor part of the undertaking for which MNR is asking our approval. MNR claims to provide the "best mix" of resource benefits through their integrated management approach, involving land use issues that go beyond the capability of timber management planning.

MNR recognized during the hearing that the public would not accept a planning process in which no commitment was made by MNR to deal with non-timber objectives in the Plan. The public told us that timber operations are, in their opinion, the largest unnatural disruption and most widespread activity in the forest. MNR first proposed dealing with management objectives for non-timber values in its 1990 Terms and Conditions and strengthened this commitment in January 1992.

MNR is proposing to deal in the Plan with non-timber objectives where they already exist in formal policies, to consider problems and issues for non-timber objectives in the "context of manipulation of the forest cover" and to develop strategies to minimize problems or take advantage of opportunities for non-timber objectives in timber management planning. We discuss this "constraints management" issue more fully in Chapter 8, p. 288. We are accepting MNR's approach with conditions that clearly specify how non-timber objectives and strategies will be dealt with in timber management planning. In our view the protection of non-timber values holds equal status and importance to the purpose of providing timber. We are persuaded, however, that there are limits on the ability to deliver all the forest resources the public wants through timber management planning, although these limits seem to us to be less than MNR claims.

Which formal policy level objectives can the public expect to see identified for other forest values in a Plan? Many of these objectives now exist in District Land Use Guidelines, government's agreements with native people, shared responsibility with the Ministry of Environment and Energy for water resources, and the like. Each district has a completed District Fisheries Management Plan and work is under way to develop a strategic plan for wildlife management. Other examples include fire management plans and management plans for the Provincial Park system. This array of plans and guidelines confuses the public and us and has led to calls for comprehensive forest management instead of the more narrowly defined timber management approach. MNR has the authority and responsibility to manage almost all Crown land forest resources, and it chooses to hive off the management of timber as something separate.

In defence of its position, MNR gave us the example of managing moose populations as something that goes beyond the reach of a timber management plan. David Euler, an MNR biologist, described timber management as the "mother plan" – needed to produce wildlife habitat, but useless in sustaining moose numbers if there is no related strategy for controlling hunting, illegal harvest and predation.

What will be in the Plan about forest values for which there are no existing objectives? MNR argues that in many situations creating measurable objectives for other values is

neither necessary nor possible through timber management planning, but all the same it is possible to respond in a "practical fashion" to address "local problems and issues that could reasonably be dealt with in a Plan." MNR argues that it can protect a canoe route without developing an objective of creating X kilometres of canoe routes and similarly protect berry picking areas from timber operations without setting the production of Y kilos of berries as an objective of the Plan. David Euler testified that setting measurable objectives for non-game wildlife is virtually impossible because the populations of these species cannot be inventoried at any reasonable cost (trans: vol. 92, pp. 15456-57).

Currently there is no formal provincial remote tourism policy; its formulation and the level of provincial support it will receive could only be decided by the government – not the timber management planners or MNR. We were told in 1992 that a joint MNR and Ministry of Tourism and Recreation task force had submitted a proposal for policy development focusing on management of the resource-based tourism industry. Under MNR's proposals, the concerns of a remote tourism operator about the potential impacts of timber activities will be identified as a problem or issue in the Plan and a strategy to deal with it will then be developed, most often through the Areas of Concern planning process.

We agree with MNR's submission that its proposal can deal with pre-existing objectives for non-timber values, develop strategies for non-timber values in appropriate circumstances, provide protection for these at the present time and integrate into timber management planning future provincial objectives such as landscape management. We believe our Condition 23 requires MNR to consider many if not most forest values typically found in a forest management unit but we acknowledge that there are limits to how timber management planning can be used to develop policies for non-timber values:

23. (a) **Each Timber Management Plan shall identify the management objectives for non-timber values which exist in other plans or policies, and which could be affected by timber management activities to be carried out under the Plan. Problems and issues with respect to those objectives which are related to timber management activities will be described. Timber management strategies intended to assist in meeting those non-timber objectives which involve the manipulation of forest cover will be described in the Plan.**
- (b) **The specific sources of the existing objectives (e.g. District Land Use Guidelines, resource management plans, government agreements with native people) shall be stated, and the geographic area for which those objectives have been developed shall be identified.**
- (c) **Where management objectives for non-timber values are not identified in other plans or policies and such non-timber values can reasonably be dealt with in a**

Timber Management Plan through manipulation of forest cover, Timber Management Plans may determine management objectives for them.

We rely especially on Condition 23(c) to ensure that where possible and otherwise advisable, Timber Management Plans may determine unsettled or non-existing objectives for non-timber values. Condition 23(c) applies where the Plan author is faced with a non-timber value that needs to be protected or some other local problem or concern for which no management objectives exist. In this situation, we are requiring the Plan author to consider setting objectives based on his or her judgement, local circumstances and public input. While we are not requiring MNR to use timber management planning to set objectives for all forest values at either the management unit or provincial level, we encourage the Plan author to do so if objective setting provides a solution to local problems that can reasonably be dealt with in the Plan. Conclusions on the success of meeting non-timber objectives will be reported in the Report on Past Forest Operations (Appendix 8) and the State of the Forest Report (Appendix 22).

Issue Resolution

Timber management planning is controversial. Rarely can one interest be entirely satisfied. At the hearing, the term "trade-off" was used to describe the concept of balancing everyone's interests to achieve some acceptable solution among timber and other forest values. We are ordering an issue resolution process in Condition 64 as a means of problem solving and we link this process to Condition 70 on bump-up.

Gordon Baskerville defined a stark trade-off with his question "How much would I give up in success in my salmon fishing on the way to work in the morning in order to have a hundred more jobs in the local community?" (trans: vol. 165, p. 29237). Depending on the respondent, the answer might range from none to all or somewhere in between. In Dr. Baskerville's case, he learned after going through this trade-off exercise that he placed more importance on employment than he had previously realized. Dr. Baskerville proposes adaptive management, including the use of habitat supply analysis (discussed on p. 398) as a means of finding an answer quickly but he admits that the conflicts will never be eliminated.

Has consensus been achieved in timber management planning in other jurisdictions? The answer is no. We heard evidence about long-raging battles over forest resources in the United States, with disputes often remaining unsettled even after years of litigation.

Peter Hynard, an MNR forester with many years experience resolving disputes among timber and non-timber users in the Minden area, observed that it is usually possible to accommodate a person with a direct, "concrete" interest in a specific area but much more difficult to deal with a "philosophical objection" to a Plan. He concluded that if someone continues to object to the way their concern is addressed, "their only recourse is bump-up" (trans: vol. 91, pp. 15321-23). The evidence we received at the hearing leads us to agree. This does not mean that one type of interest is more legitimate than the other, but we believe the planning process must respond as quickly as possible to a concern raised by the public where a practical, mutually satisfactory solution can be found.

The evidence we received on the Area of Concern planning process demonstrates the potential for speedy resolution of site-specific values; the public should not be kept in suspense about the final outcome for protecting their concerns in the Plan. For this reason, we accept the proposal of OFIA that the personal intervention of the Plan author be a first step in issue resolution. We are persuaded that the Plan author is in the best position to determine if a concern is likely to be addressed satisfactorily in a Plan through the AOC process or by any other means.

Robert Payne, an associate professor at Lakehead University and witness for FFT, submitted that MNR can defuse confrontation if it does a cost-benefit analysis of the forest uses in dispute and takes a position so that the parties will understand how and why MNR made the decision (trans: vol. 269, p. 48663). Mr. Payne is optimistic that this approach might achieve consensus 95 times out of 100 (trans: vol. 269, p. 48679). We are not convinced that cost-benefit analysis can be applied to the resolution of all disputes between timber and non-timber users, and we discuss its utility on p. 199. We also considered the proposal of Northwatch witnesses Professors Peter Homenuck and Mark Dockstator for environmental mediation by a neutral third party because they believe that MNR's "absolute power and unilateral authority to determine the manner, extent and degree to which the public's input will be managed" means that the public cannot force changes in timber management planning (trans: vol. 371, p. 64574). The evidence we heard persuades us that an outside mediator is less likely to provide a locally acceptable solution to dispute than the Local Citizens Committee, whose members represent parties with an interest in timber management planning, working directly with the Plan author, the planning team and the district manager. We support the idea of employing an environmental mediator and other alternative dispute resolution techniques if the Local Citizens Committee, the Plan author and planning team and district manager believe such assistance would benefit the development of their particular Plan. But we consider this to be their decision and unnecessary for us to specify as a compulsory Condition of Approval.

We heard more complaints about the failures than commendation of the successes in resolving problems in timber management planning. Gaetan Malette, an OFIA witness, thinks that the good examples of multiple forest use are ignored. "Local people solve their issues, everyone is happy and life goes on. The issue stays locally, the media, the lobbyist, the voting population do not hear about it. These issues do not go to bump-up, they were resolved" (trans: vol. 234, p. 42720). Mr. Malette offered us two instances of successful issue resolution between his company, Malette Inc. and other forest users on the Romeo/Malette Forest. In one case, a local trappers group and the company cooperated in rehabilitating a pickerel spawning area. The company rebuilt a bridge and supplied rocks and the trappers cleaned the spawning site. In the other, a cottager suggested for the 1987-92 Plan that the company should upgrade the cottagers' road and use it instead of building a new access road and the company agreed (trans: vol. 234, p. 42719).

Decisions about roads are especially contentious, often pitting local residents against tourist operators for access to lakes. Road disputes account for more bump-up requests than any other kind of issue. During the Coalition's case we learned of a forest road access committee whose members were drawn from MNR, the Ministry of Tourism and Recreation, the forest industry, the Coalition and private consultants. This committee was considering road linkages which were opposed by remote tourist operators. The district manager decided against approving the road linkages in favour of "maintaining the viability of the remote tourism industry in the Atikwa and Rowan Lakes area" and he promised to "assess the need to reconvene that committee" if other road linkages were proposed in future (Ex. 2154). The reservation expressed by Bud Dickson, the Coalition's witness, to what seems a satisfactory agreement for tourism interests shows the extent of mistrust and bad experiences with issue resolution over the years. "As far as going ahead in the future, five or six years from now, history hasn't always been kind to us in keeping those kinds of promises and I hope, you know, in this case that is the case," Mr. Dickson said (trans: vol. 363, p. 63265).

One example of issue resolution that we considered carefully eventually reached an outcome agreeable to the parties, but the Lake Weslemkon Conservation Association (LWCA), with membership of 250 cottagers, year-round residents and resort operators, complained that their experience with the timber management planning process was totally unsatisfactory. The association said information on notices, Plan documents and maps was confusing and used selectively by MNR, there was secrecy in the process and MNR would not deal with them in an up-front manner. It also said that too much time was required of the public to attend meetings and write letters and complained that MNR held information centres at inconvenient times and locations (Ex. 1433(A), Tab 6). Over 30 exhibits were submitted to describe the dispute between MNR and the association over the proposed construction of

the Ashby-Trout Lake Road, planned under MNR's Class EA for access roads to MNR facilities.

What do we make of a process that took three years to resolve the concerns of one party with one Plan and was, from our reading of the evidence (although MNR and the association cannot agree on all the facts) acrimonious and full of miscommunication? Some might argue that MNR used the planning process to confuse the association, withheld important information, ignored the group's concerns and stalled a resolution until after the Plan was approved in hope that the opposition to the road would be worn down or less credible. Others would say that MNR bent over backwards to accommodate the concerns of the association, which responded with evasive tactics, refused to consider reasonable solutions proposed by MNR and used the bump-up process and the hearing as bargaining chips. Neither interpretation is likely correct, but the extreme views persuade us the issue resolution process we approve must be timely in giving the public confidence that their concerns are being dealt with as quickly as possible but not to the detriment of holding up or derailing the timber management planning process. We also believe the Ministry of Environment and Energy must be ready to take an active role in making issue resolution work. If it fails, the next step is the bump-up process, putting the final decision squarely in the hands of MOEE.

Our design for the issue resolution process incorporates many aspects of proposals agreed to by MNR, FFT, the Coalition and MOEE (Ex. 2032) and others from OFIA's enhanced planning proposal. As a first step, we require the Plan author to meet with the concerned party to explore the possibility of finding a speedy acceptable solution. If agreement is reached, it will be recorded in the supplementary documentation to the Plan. If a solution is not readily found, the Local Citizens Committee and the MNR district manager will become involved and we agree with OFIA that a site visit should be considered as a direct way of finding a solution. If the problem persists, the district manager will ask for concrete proposals from the Plan author, the complainants and the LCC (within 15 days of his request) and make a decision within 15 days of receiving the proposals.

If the person with the concern is dissatisfied with the district manager's decision, he or she can request a higher level review by MNR's regional director, who will consider the views of the Local Citizens Committee, the Plan author and the district manager and provide a written decision. The regional director will complete the review and provide a written decision within 45 days following the district manager's decision.

The issue resolution process can be concluded with a satisfactory resolution to the complainant provided in the first two stages by either the Plan author or the district

manager. If the decision of the regional director satisfies the complainant, the issue resolution will be concluded at this point. If the regional director's review results in a decision unsatisfactory to the complainant, we also consider the issue resolution process to be concluded and the complainant has the option of the bump-up process.

Separate from the issue resolution process described above is Condition 62, pertaining to MNR's Plan Review and Approval process, which provides an opportunity for the public to review the final list of required alterations about 45 days before MNR approves the Plan. A person can request a formal review by the regional director of a specific timber management Plan decision as soon as possible after receiving this list. We believe this review procedure is too late in the planning process to accommodate effective issue resolution as described above in Condition 64. We are leaving it to the discretion of the regional director to deal with complaints received about the final list of required alterations as he sees appropriate. In our view, a complainant who does not get involved in the issue resolution process early in the planning process is unlikely to obtain a satisfactory solution once MNR has developed its final changes to the Plan.

Throughout any stage of preparing the Plan, an amendment or Insect Management Program, anyone may make a bump-up request to the Minister of Environment and Energy as discussed in Condition 70 below. The Board recognizes that issue resolution may have to be compressed for Insect Pest Management, but as we discuss in Chapter 7, p. 257, we think this will be an infrequent occurrence associated with some unpredictable aspect of insect infestation.

We have carefully considered the evidence on matters pertaining to issue resolution and the bump-up procedure and we conclude that the two are interrelated. We believe that the issue resolution process has greater potential for finding practical, faster solutions to problems than does the bump-up provision, and that recourse to bump-up can derail issue resolution if the two are parallel processes. In our procedure, the Minister of Environment and Energy's decision on a bump-up request will follow completion of the issue resolution process in most circumstances. We compare the evidence we heard of hundreds of situations where concerns and problems were dealt with in the AOC process or elsewhere in the development of the Plan to MOEE's evidence that 22 bump-up designation requests concerning timber management were made between 1988 and 1992 (trans: vol. 373, p. 64851). Some of these took years to be decided by the minister. Of the 22, 13 were denied, four withdrawn, four were still under review in April 1992 and only one was granted. We interpret this record to mean that the public's concerns will be more productively resolved by issue resolution within the timber management planning process. In a report in June 1991, the Ontario Environmental Assessment Advisory Committee said MOEE's process for

responding to bump-up designation requests was "abysmal" (Ex. 1973, p. 37). The report said "it was difficult for the public to believe that there was any serious consideration of their designation requests" (Ex. 1973, p. 25). It recommended that the ministry adopt criteria for considering these requests, a step that has since taken place.

We are supported in this view by the evidence of the Ministry of Environment and Energy of the importance they placed on the issue resolution process as an important mechanism to resolve conflicts (trans: vol. 373, p. 64879). MOEE submitted in final written argument that it opposes proposals that:

would discourage the public from seriously attempting to resolve concerns early in the planning process. In short, MOEE did not believe that bump-up should be viewed as a bargaining chip but rather as a method of investigating environmental impacts that could not or were not foreseen in the approval of the Class EA.

(MOEE Final Argument, p. 127)

We conclude therefore that successful issue resolution can be achieved if the Minister of Environment and Energy defers determining a bump-up request until the conclusion of the issue resolution process, which is with MNR's approval of the Plan, and we order Condition 71 to achieve this result. Our Condition 70 and Appendix 15 allow for the discretion of the Minister of Environment and Energy in all matters pertaining to bump-up requirements, give the public every opportunity to make such requests and ensure that approval of the Plan does not allow timber operations to be conducted in areas affected by a pending bump-up request.

The Bump-up Provision

We have carefully considered the relationship between issue resolution and bump-up and we conclude that neither process would be productive if parties with a concern or complaint gamble on getting what they want from a bump-up request and avoid the issue resolution process described above. We find this tactic unacceptable and we believe it could lead to obstructing the timber management planning process we are approving. We encourage bump-up requests to be made early, and they are permitted at any time during the planning process. A bump-up request resulting from a failure of the issue resolution process can be made as late as 30 days following the Stage 4 notice of approved Plan inspection. MNR will have 15 days to respond, and the decision of the Minister of Environment and Energy will normally be made within 45 days of the last opportunity to make a bump-up request. There was a complaint from one Aboriginal leader that 30 days is too tight a deadline for his

community to consider a bump-up request, because they may be away hunting and, in any event, require time to do consensus building. We believe that our Conditions for public consultation generally and for the Timber Management Native Consultation Program will give native communities lots of opportunity to participate in issue resolution and make bump-up requests months ahead of the final deadline, but this is an example of where the Minister of Environment and Energy will use his or her discretion in finding a fair solution to meet a particular interest.

The evidence of the Ministry of Environment and Energy supports our view that "last-minute" bump-up requests, perhaps motivated by a strategy to circumvent the issue resolution process, are not a constructive approach to finding satisfactory solutions. We were told by Darlene Dahl, witness for MOEE, that the ministry wants the public to satisfy its concerns within the timber management planning process and not use bump-up as a conflict resolution mechanism (trans: vol. 373, p. 64886). MOEE supports the view that the decision of the minister will not be made until the end of the planning process and the last opportunity for the public to make a bump-up request.

Although the evidence we heard convinces us that in most cases the Minister of Environment and Energy's decision about a bump-up request should be left until the timber management planning process concludes, there may be situations we cannot foresee where the minister decides it is necessary to approve a bump-up request during the process. We acknowledge that this is within the discretion of the Minister of Environment and Energy and we are ordering in Appendix 15, section 6 that MNR may continue timber management planning and grant approval for activities in areas unaffected by the approved bump-up request, with the concurrence of the director of MOEE's environmental assessment branch.

We are accepting some of the proposals of the parties in our Condition 70 and Appendix 15 and rejecting others. FFT and the Coalition propose extending the deadline for making bump-up requests. We find the 30 days adequate because the public will have had almost two years by the time the Plan is approved to identify their concerns and participate in issue resolution.

MOEE's response time to deciding bump-up designation requests has been unacceptably long. Most of the 22 timber management bump-up requests made since 1988 did not receive a decision from the Minister of Environment and Energy until November 1991 and four remained unanswered as of April 1992 (trans: vol. 373, p. 64883). MOEE's explanation for these long delays was that it had no consistent procedures or guidelines for the review of bump-up requests. The minister requested the Environmental Assessment Advisory Committee (EAAC) to conduct public hearings on some of the requests and EAAC

reported its recommendations in June 1991 (Ex. 1973, EAAC report #48). We suspect that the continuation of our hearing also contributed to these delays. We acknowledge the discretion of the Minister of Environment and Energy in all aspects of the bump-up provision, but our Conditions provide that the Minister's decision shall normally be made within 45 days of the last opportunity to make a bump-up request.

How should timber management planning proceed while bump-up requests remain outstanding from the earliest stage of the planning process until after final approval of the Plan? We share FFT's concern that the bump-up provision is essentially useless if timber operations can take place in specific geographic areas covered by the bump-up requests before the Minister of Environment and Energy makes the final decision. For this reason we are ordering that where a bump-up request remains outstanding, MNR may permit timber operations to proceed only in areas unaffected by the request, and only if the director of MOEE's Environmental Assessment Branch concurs. The requester of the bump-up will be notified.

We rejected proposals on the bump-up provision that in our view would be inconsistent with the powers of the Minister of Environment and Energy under the *Environment Assessment Act*. FFT proposed that the minister should grant a bump-up request if the proposed activity is likely to cause significant environmental impacts or if there are unresolved public concerns about the proposed activity. OFIA proposed limiting the grounds for making a bump-up request to one where "the potential environmental effects of a specific proposed timber management activity or set up activities will not adequately be addressed by the procedures set out in this Class EA." We are satisfied that MOEE's February 1992 guideline on interim criteria for evaluating exemption, designation and bump-up requests, which is being used on a trial basis, is sufficiently comprehensive for the minister to make a decision. The information and documentation submitted by the requester will be evaluated on these criteria:

- (1) an assessment of the potential effects.
- (2) the extent to which MNR has complied with the timber management planning process established in our approval.
- (3) an assessment of the overall benefit of the bump-up (i.e. how an individual environmental assessment can assist project planning and decision making).
- (4) reasons for the requester's concern.
- (5) the adequacy of other legislation and approvals to deal with issues of concern.

The Coalition proposed that bump-up requests be available for not only major amendments to the Plan but also for administrative and minor amendments. We discuss the amendment procedure on p. 119. In our view, matters eligible for administrative and minor amendments should be relatively unimportant to the overall implementation of the Plan and as such can be decided by the district manager within the procedures we approved in Condition 67. If MNR abuses the amendment process by incorrectly categorizing issues as administrative or minor when they should be major amendments, MOEE will have evidence of this and will correct any deficiencies in its eventual review of this undertaking. We are specifying in Condition 114(a)(ii) that MNR include a complete record of all administrative, minor and major amendments made to Plans during the term of our approval.

FFT and Northwatch proposed that bump-up requests be available for Contingency Plans, which are used by MNR if a Plan is not approved before the previous Plan expires (Condition 66). We interpret Northwatch's argument to be that they do not trust MNR's commitment to identify harvest areas in contingency plans in "the least contentious areas possible" (trans: vol. 407, p. 69575.) We share Northwatch's concern that misuse of contingency planning could potentially result in timber management operations proceeding inappropriately, but we received no evidence that this has occurred. We are satisfied that our Condition 66 will safeguard against any abuse of contingency planning and we believe this approach will be more effective than bump-up requests.

We disagree with the view of OFIA that bump-up requests are a sign of the failure of the timber management planning process (trans: vol. 219, p. 39768). We support the bump-up provision as a "safety net" to our approval where we have been unable to address adequately concerns that might arise during the timber management planning process or where the expected environmental effects may be more severe and unpredictable than originally anticipated (trans: vol. 373, p. 64871). We do not think that 22 bump-up requests covering 70 approved Plans over four years is evidence that the bump-up provision is being overused or inappropriately used in spite of MOEE's evidence that 22 bump-up requests for timber management planning outnumber those received for the municipal Class EAs covering 800 municipalities. Ex. 2215 shows timber management bump-up requests by type, requester and issue: no one group is using bump-up more than any other and the most contentious issue is access roads. We are concerned about the evidence of Charles Alexander for the Coalition, who testified that bump-up requesters were ridiculed by other people through the media. We believe that the conditions for our approval for issue resolution and bump-up will be viewed over the coming years of experience as ways of reducing conflict by finding acceptable solutions to concerns about timber management planning. Bump-up requests will be integrated with issue resolution and if their number increases, we can take this as a sign of increased public awareness and participation. We are approving in Condition 59 MOEE's

proposal for an "EA index" to be contained in each Plan and summary to help ministry staff locate the information necessary to review bump-up requests.

INFORMATION

At the hearing, parties such as FFT and the Coalition effectively criticized MNR's collection and use of information for timber and other forest resources. MNR responded with initiatives and commitments to improve its forest inventory and to explore or adapt new information management technologies. The new technologies involve expensive computerized databases and mapping. Each project is a building block that will result in large, integrated information systems that should satisfy the needs of all forest users. MNR has come around to the view of the intervenors – and this change of attitude can be traced to the Sustainable Forestry Initiative of 1990 – that it has a responsibility to serve the information needs of all forest users. MNR argues, and we agree, that timber management planning can be conducted in the meantime as the improvements to forest information systems are made.

Background Information Needed to Prepare the Plan

Forest Resource Inventory

Is our knowledge of the forest adequate to carry out timber management planning? MNR's position that there is an "acceptable level of detail" in its Forest Resource Inventory (FRI) for timber management planning is disputed by some of the parties. There is agreement on the basic minimum requirements: the forest area determined to have successfully regenerated, naturally or artificially, by the measurements of Free-to-Grow assessments during the previous five years will be identified as "accruals" or additions to the inventory and the forest areas affected over the previous five years by logging, fire, insects, blow-down and disease will be identified as "depletions" or removals. We are persuaded that this updating is necessary as a starting point to the background information requirements for developing a Plan and we are ordering its production in Condition 15. MNR explained how Forest Resource Inventory information is collected, recorded and used (MNR Panel 3, Ex. 78) and we concluded that the complexity and expense of doing an inventory on a forest as large as ours in the area of the undertaking means that we will never know our forest resources in anything like perfect detail.

We heard complaints about the accuracy and completeness of the inventory. FFT's proposed solution is to conduct pre-operation inspections involving field surveys of all areas

allocated for timber management activities during the Plan to provide better information on timber and non-timber values. The Coalition proposes "on-site reconnaissance" surveys to be conducted before all logging operations. MNR does a limited amount of field survey to supplement the Forest Resource Inventory through "operational cruising" (OPC) at a cost of \$800 per square kilometre compared to \$50 per square kilometre for conducting the inventory. MNR argues that operational cruising is available in specific circumstances, but should not be mandatory everywhere. Frank Kennedy for MNR told us that many foresters "would love to have the opportunity and resources to look at each hectare" before planning timber activities but it is simply impractical to do so. MNR's position is that the decision should be made by the forester who will consider personal knowledge, historical records of Forest Resource Inventory accuracy, the commercial timber value and diversity of the forest to justify the time and expense of doing operational cruising. Nickolas Saltarelli for OFIA and George Marek, a witness for the FFT, support MNR's view that sufficient information about wood supply is available from resources other than operational cruising. We discuss the limitations in using inventory data to provide precise timber volume estimates at the stand level on p. 153.

Expanding the information base and improving its accuracy for non-timber values is becoming more important as MNR examines landscape management and looks for ways to improve wildlife habitat production and recreational and other forest values. This is discussed in Chapter 11. MNR is investigating means of improving inventory data through such methods as Geographical Information Systems (GIS) digital mapping (which we discuss as Condition 108 on p. 384), infrared photography, large scale photography, mini-prints, micro-computer data capability and standardization of Forest Resource Inventory data, many of which were recommendations in the Rosehart Report (An Assessment of Ontario's Forest Resources Inventory System and Recommendations for its Improvements, Ex. 93). We also received evidence from Professor Ulf Runeson at the Lakehead University Centre for the Application of Resources Information Systems about how satellite imagery and digital data can be manipulated to produce useful information for foresters.

Fisheries and Wildlife Inventory Information

MNR takes the position that fisheries and wildlife information exists for every Forest Management Unit. As we discussed in Chapter 2, FFT and the Coalition argued that while MNR collects a great deal of information about fisheries and wildlife, it is not used properly for the purposes of timber management planning.

We reviewed the evidence on MNR's collection of fisheries information. The Aquatic Habitat Inventory Survey (AHIS) Program, started in 1986, had surveyed 9,191 lakes by 1991. The Fisheries Assessment Unit Program collects "trend through time" data on the response of lakes to stress including the effects of timber management. In addition to these two main programs, MNR has been doing lake surveys for fisheries management for 20 years (Neville Ward, trans: vol. 52, pp. 8921-26). Special "reconnaissance surveys" of lakes are sometimes done for timber management planning to identify fish species, shoreline slopes and important fish habitat. MNR also collects information during stream-crossing inspections and from fishery studies such as creel surveys. MNR's directive on "Use of Timber Management Guidelines for the Protection of Fish Habitat" (Ex. 304, pp. 3-4) require that if available fisheries information does not meet minimum requirements, conservative protection measures must be used in planning timber management activities.

MNR's 1988 policy on Wildlife Information for Use in Timber Management Planning requires collection of information about wildlife resources. This includes adequate data to implement habitat guidelines and habitat data to be collected for threatened and endangered species as designated under the *Endangered Species Act* and for moose and deer. The district manager will decide which habitat data will be collected for other species (Ex. 266(A), p. 308). Wildlife information collected on a regular basis by MNR includes aerial moose inventories (which also inventory eagle nests) and the wildlife harvest data on hunting and traplines. Wildlife managers also assess current or potential wildlife habitat through aerial or ground investigations (Ex. 266(A)).

During the hearing, MNR improved its collection and use of wildlife data for timber management planning with the development of a Wildlife Habitat Inventory Standards Manual. The Wildlife Habitat Inventory Committee developed methodology for classifying land into areas of high, medium or low moose production capability, and a similar mapping of the production capability of land for caribou has been developed. An assessment of habitat suitability for deer will be conducted (Ex. 2252, MNR Reply 1, p. 25). For fisheries, there is now field direction for identifying headwaters and the timing of return cuts on certain waterbodies and MNR plans to revise the Fish Habitat Guidelines to provide greater protection for muskellunge lakes and streams.

We are ordering Condition 16 to ensure that adequate inventory information on fisheries and wildlife is available for each forest management unit for use as background information in timber management planning.

Values Maps

Values maps are an important source of background information for developing the Plan and essential to the Area of Concern planning process as discussed on p. 91.

Proposals by the Parties

OFIA

In Appendix 5, we accept with changes OFIA's proposal for listing the types of background information that will be assembled and analyzed by MNR and the Plan author before the invitation to participate is issued. This clearly delineates the responsibility for producing the information and provides a good "checklist" against which the preparation of background information can be measured as complete or lacking.

FFT

FFT proposed adding requirements for collecting background information for timber management planning: information on soil and water resources including consumptive and non-consumptive water uses and bio-geo-chemical composition of soils and surficial geology; information on existing and future recreational resources and the development of a "recreation opportunity spectrum;" and information on visual resources and visual quality (FFT Conditions 14, 15 and 16). FFT also proposed mandatory collection of background information on Areas of Natural and Scientific Interests (ANSIs) and historic or cultural resources. We rejected these proposals, but we believe that the inclusion of these resources on the values map, Condition 99 on ANSIs and the Timber Management Guidelines for the Protection of Cultural/Heritage Resources will ensure that they will not be overlooked.

We are persuaded by the evidence and argument of MNR that, given the huge size of our forests, there is an unlimited number of subjects for which data could be collected. As MNR admits, with "current staff, resources and systems, we are hard put to manage all of the data that we have now and collect regularly." We agree with MNR's view that it is impossible to collect information on all forest resources. Priority must be given to specific information needed to avoid unacceptable negative effects on the environment from timber management operations.

We do not dismiss the importance of visual resources, as identified by FFT, and we are ordering Condition 24 to address the concern of the public and tourist operators for

protection of visual quality. This and other projects we are ordering to improve MNR's information base are discussed in Chapter 11.

Information Contained in the Plan

Report on Past Forest Operations

The Report on Past Forest Operations (RPFO) is the history of timber management operations carried out in the previous five-year Plan. As FFT proposed, comparison will be made between what was planned and what actually was done in building roads, harvesting, regeneration, maintenance and protection operations. We accept the Coalition's proposals to report on clearcut size, annual government revenues for stumpage and area fees and wood wastage volumes because the public told us they want this information. We accept MOEE's proposals to report on area inspections because the public should know of infractions and problems with compliance and also a statement on silvicultural effectiveness will be included so that the public can track regeneration success. As discussed on p. 313, this report will describe problems, issues and undesirable conditions observed and build on this experience to recommend strategies for the new Plan to correct or improve future timber management operations. The complete contents of the Report on Past Forest Operations is set out in Condition 21 and Appendix 8.

Supplementary Documentation

The supplementary documentation we order in Condition 56 and Appendix 9 will describe the information used and developed in the planning process. It could run to hundreds of pages. Decisions about reproducing it on request will be left to the district manager, but the documentation will be kept where the draft and approved Plans are available for public inspection at MNR and MOEE offices (Condition 65). The sources of the background information described above will be in the supplementary documentation as will the list of Implementation Manuals used to prepare the Plan. We consider the report of the Local Citizens Committee to be an essential element of public consultation and it will be found in the supplementary documentation.

Information Collection and Management: Future Work

Information Systems

The parties to the hearing and the public told us they want more information on timber and other forest values and better access to it. We observed problems with MNR's information management system during the hearing: when a party asked MNR for data it was most often met with the frustrating answer that the information did not exist in a usable format or could not be made available without costly months of digging by MNR staff.

MNR proposes a solution in the Integrated Natural Resources Inventory System (INRIS), whose feasibility is being studied with the ambitious objective of ultimately being "the repository for most, if not all of MNR's data, information and knowledge about the natural resources of Ontario." John Osborn told us that MNR is concentrating over the next three or four years on two components of INRIS: derived Forest Ecosystem Classification (FEC) and enhanced Forest Resource Inventory (trans: vol. 389, pp. 67016-26). Condition 95 requires MNR to speed up its collection of timber and other forest information and improve its systems so that data are easily retrievable and available to the public. We believe this Condition is a first step in satisfying the public's demand that timber management planning be used to the benefit of other forest values wherever possible. It acknowledges MNR's move towards more integrated resources management.

MNR has also initiated a Timber Management Planning Information System (TMPIS) to assist foresters who estimate that updating and manipulating resource information accounts for 20% to 25% of the effort required to develop a Plan (Ex. 2272, MNR Reply 3, p. 14). Over time this information will become part of the Integrated Natural Resources Inventory System.

Reporting Silvicultural Effectiveness

At the hearing, MNR was challenged to prove it is spending money effectively on regenerating the forest. Not until the Forest Management Agreements of 1980 were specific silvicultural objectives developed for Plans. The provincial auditor's 1986 Report on the Audit, Forest Management Activity, Ministry of Natural Resources (Ex. 28) criticized MNR for failing to collect silvicultural information and assessment data on a province-wide basis and for spending money on regeneration treatments but not receiving information until five years later with the first stocking survey.

MNR relies on "Free-to-Grow" surveys as the single most important predictor of regeneration success. These surveys are done when a stand is about 10 years old. OFIA prefers to rely on fifth-year stocking assessments, which ascertain if the minimum stocking standard set in the Forest Management Agreements has been met or exceeded. This gives an earlier indication to industry, which has the obligation for re-treating an area if necessary (trans: vol. 202, p. 35979). FFT argued that survival surveys of planted seedlings should be required in all cases. FFT disputed OFIA's claim that artificial regeneration for conifer is more successful than natural regeneration. MNR and OFIA take the position that both artificial and natural regeneration methods are required depending on the regeneration objective and the site type. The evidence shows that about 50% of the area harvested each year is treated by planting or seeding. We found the absence of an historical record on regeneration treatments and their documented success or failure to have exacerbated the dispute over the meaning of statistical evidence on regeneration. We discuss the evidence on regeneration success and make our findings in Chapter 6.

The Ministry of Environment and Energy's criticisms of MNR's approach to silvicultural effectiveness reporting were central to its case. MOEE proposed many conditions to supplement FTG with information that would link regeneration success or failure to specific sites, species and silvicultural treatments, particularly the logging method selected, in each Plan. We discuss MOEE's proposals and silvicultural effectiveness monitoring in Chapter 8.

We accept the parties' agreement on Condition 96, requiring MNR to improve the assessment, recording and reporting of silvicultural effectiveness for natural and artificial renewal methods. MNR is replacing its existing Silvicultural Information System (SIS) and Silvicultural Assessment System (SAS) with a new system called Silvicultural Treatment Effectiveness Monitoring System (STEMS) to provide easier access to site-specific information collected over time and to improve MNR's ability to report regeneration success to the public (Ex. 2272, MNR Reply 3, p.13). The development of STEMS is linked to the Integrated Natural Resources Inventory System described on p. 316 and MNR estimates that STEMS may not be fully operational until the year 2005. In Chapter 8 we discuss how silvicultural effectiveness will be monitored and reported until the STEMS project is completed.

Northern Ontario Wetlands Evaluation System

FFT challenged the position taken by MNR early in the hearing that northern wetlands were not part of the timber management undertaking or environmental assessment. In mid-1990

MNR began developing an evaluation system for northern wetlands and field-tested it on 39 northern wetlands in 1991 (Ex. 2272, MNR Reply 3, pp. 16-17). MNR then reduced its estimate of the time to develop the system from five to three years. David Balsillie, MNR's assistant deputy minister for policy, informed us of a new wetlands policy that was passed under s. 3 of the *Planning Act* (trans: vol. 394, p. 67830). MNR identifies classified wetlands in southern Ontario and important wetlands in northern Ontario as values to be shown on the values map for timber management planning. FFT contends in argument that northern Ontario wetlands are being altered for the purposes of timber management.

We accept MNR's commitment to develop a northern Ontario wetlands evaluation system to provide information for protecting wetlands in timber management planning within three years of our approval under Condition 92. In our Appendix 20 we require annual progress reports to the Legislature on this initiative, and in Condition 114 we require a report to MOEE.

Areas of Natural and Scientific Interest (ANSI)

ANSIs are areas of land and water containing natural landscapes or features which have been identified by MNR as having values related to protection, natural heritage appreciation, scientific study or education (Ex. 325). Since the provincial policy was introduced in 1983 and the implementation strategy in 1987, MNR has designated in the area of the undertaking 89 ANSIs (of which 17 are life science, 65 are earth science and seven are combined). There are 102 candidate ANSIs. Both designated and candidate ANSIs are protected during timber management planning through the Area of Concern process.

Parties at the hearing argued that MNR should accelerate its program to identify candidate ANSIs so that these areas can be considered in each Timber Management Plan. MNR responded with a proposal to complete its survey of candidate ANSIs within five years of our approval at an estimated cost of \$800,000. We are ordering MNR to proceed with this work in Condition 99. Again, we require annual progress reports on this subject.

Socio-economic Analysis

The consequences of timber management planning for the social and economic environment of Ontario are of equal importance to the protection of the physical environment of our forest. The evidence of FFT, the Coalition and CASIT among others, persuaded us that MNR's information on and method of analyzing the social and economic aspects of timber

management planning were deficient. MNR responded to the criticisms of the parties with a proposal to investigate appropriate methodologies for assessing social and economic advantages and disadvantages and their applicability to timber management planning. We discuss the evidence we received and our findings in Chapter 9.

Reports

The public told us they want simple-to-understand statistics on the issues they consider to be important or problematic: logging and clearcut size; regeneration; road building and roads gated, signed or abandoned; summaries of area inspection reports and monitoring; timber lost to fire, insects and other natural forces; government revenues from the forest industry; and wood wastage. MNR invests hugely in scientific and technical research and studies, and while we agree this work is necessary we think MNR overlooks the importance of giving people the basic information they ask for. Sometimes MNR may be overly concerned that non-experts will misunderstand or misinterpret the data. The public does not expect to be given the "full picture" of every detail of timber management planning. But they demand a reporting of forest statistics that can be compared from one year to the next, give an idea of what has been done in their local forest and across the province generally and can be found in easily accessible published sources. We accept MNR's proposals for reporting to the public with changes suggested by the intervenors and the public.

We order that an annual report be prepared for each management unit (Condition 79, Appendix 18). The information in the annual reports will be used to develop the Report on Past Forest Operations for the Plan and the provincial Annual Report on Timber Management, which shall be tabled in the Legislature (Condition 82, Appendix 20). We discuss in Chapter 11 our view that regular scrutiny by the Legislature will be especially effective in motivating MNR to meet the deadlines imposed by our Conditions of Approval. We order MNR to continue keeping central records on annual pesticide use (Condition 83, Appendix 21). MNR shall also produce every five years a State of the Forest Report to give a perspective on forest growth and wood supply that cannot be seen in annual changes (Condition 84, Appendix 22). MNR estimates that the total growing stock is about 2.9 billion cubic metres of which logging affects only about 0.7 per cent annually. Therefore, this five-year view of the forest is more likely than the annual reports to show trends.

TIMBER MANAGEMENT ACTIVITIES THAT OCCUR AFTER THE PLAN IS APPROVED

There are programs or activities in timber management planning that will take place after the five-year Plan is approved. These can occur regularly, such as the annual work schedule, which gives notice of the timber operations Plan to be carried out for that year, or can be unpredictable such as contingency Plans, aerial pesticide spraying or Plan amendments. The public complained to us that they are confused by the timing and notice of these activities and we are ordering conditions to ensure that none of these takes place in isolation from the approved timber management planning process.

Contingency Plans

Although a two-year schedule to get an approved Plan into effect so that operations can begin on the April 1 deadline seems generous to us, MNR told us delays can occur in Plan production review and approval. Draft Plans might be submitted late or incomplete, there could be unresolved issues or time might be needed to make alterations to the draft Plan. If the regular Plan cannot be approved by the deadline, MNR is proposing that an "interim" Contingency Plan be prepared with the endorsement of the director of the Ministry of Environment and Energy's environmental assessment branch, with provisions for public consultation and a minimum 15 days notice of Contingency Plan inspection. We believe these provisions provide a predictable and acceptable process for contingency planning. Because of the safeguards, on p. 109 we reject FFT's and Northwatch's proposal that contingency planning be subject to bump-up requests. We do not accept that all timber operations need to be held up and local mills possibly suffer as a consequence because of administrative delays in Plan approval. We find the contingency planning provision to be an acceptable means of proceeding with timber operations that will be approved anyway in the Plan and we order Condition 66 and Appendix 12 to provide for this. If Contingency Plans, which are designed to respond to unpredictable and uncontrollable circumstances, become the norm instead of the exception, this will indicate problems in the overall planning process and will require correction when our approval is reviewed by the Minister of the Environment and Energy. MOEE will have a record of Contingency Plans for this purpose. See Condition 114(a)(viii).

Amendments

Changes to Plans during the five-year term are inevitable, whether the reasons be salvage operations in a blow-down area, rapidly changing mill demands, a labour dispute requiring

a third party contractor for planting or unavailability of harvesting equipment to meet an annual work Plan. The parties agree with MNR that the amendments can be divided into three categories: administrative, minor or major.

The amendment procedure we are approving in Condition 67 and Appendix 13 allows anyone to make a written request for an amendment to the district manager, who will consult with the Local Citizens Committee and decide within 15 days of receiving a request if planning for the amendment should proceed and which of the three categories is appropriate.

Administrative amendments are meant to cover matters where public consultation is not required such as corrections of errors in the text of tables or approved Plans. Another example we were told about approved a winter by-pass on a road to avoid a dangerous hill. The district manager shall approve administrative amendments when the necessary planning has been completed. Minor amendments are meant to cover situations where some public involvement is called for. MNR provided as an example an amendment to allow for salvage cutting after a fire. There will be one formal consultation opportunity, with at least a 15-day notice before the district manager approves the minor amendment, to learn if the public has any concern about it. If the public response shows no significant concerns or they can be resolved, the district manager can approve the minor amendment. If the public indicates significant unresolved concern, the district manager shall recategorize the minor amendment to a major one unless in the opinion of the District Manager the objection is unreasonable or unless the amendment is a matter of urgency and the regional director concurs.

Major amendments to Plans will arouse interest and be a possible concern to the public. Their planning process parallels the timber management planning process, with public consultation and approval by the regional director. In one example of a major amendment, new areas were allocated for harvest when a planned access road to other stands was lost to a funding shortfall. The district manager will provide two public consultations for proposed major amendments. A 30-day notice will normally be given for an information centre where the public can comment on the background information and evaluation of alternatives and contribute information for the decision. The district manager will then submit the proposed amendment and submit it to the regional director for approval. When it is approved there will be a second public consultation – a notice of major amendment inspection – to advise the public of the approved major amendment and invite people to examine the results of this planning process. A similar planning process for major amendments is provided under the Timber Management Native Consultation Program. All approved administrative, minor and major amendments are part of the Plan and will be filed with the Plan at MNR and MOEE.

OFIA proposed a streamlined system for planning amendments that would have the district manager make all the decisions without any public consultation required. We find this unacceptable, particularly for major amendments that could significantly change the approved Plan.

We are persuaded by OFIA that salvage operations as a result of natural catastrophe is one circumstance where the amendment planning process can be streamlined by the district manager in consultation with the Local Citizens Committee. We cannot afford to have otherwise merchantable timber damaged by blow-down or insects left to rot because of a slow planning process. We reviewed the evidence of Jack Harrison at the Sioux Lookout community hearing who described a quick start to salvage operations by a special multi-disciplinary blow-down planning team in July 1991 for the Pakwash Timber Management Plan (trans: vol. 329, pp. 57895-99). We find this approach justified and acceptable. This subject is discussed further in Chapter 7 (p. 257).

FFT proposed defining minor amendments as permitting a timber activity that "causes or is likely to cause minimal or limited environmental effects" and major amendments as likely to cause significant environmental effects. The Coalition proposed defining administrative amendments where there is "no change in the predicted net environmental effects of the Timber Management Plan" and minor amendments as those where "the predicted net environmental effects of the Timber Manager Plan are insignificant." We find these definitions to be vague and unworkable and we remain unconvinced that environmental effects can be measured with any precision or be used to describe activities falling into these three categories of amendments.

We share what we see as FFT and the Coalition's concern that MNR could abuse the amendment planning process by misclassifying major amendments as minor, presumably hoping to avoid public scrutiny and opposition. FFT proposes that for minor amendments the district manager should ensure an inter-disciplinary review before approving it while the Coalition proposes that if the LCC fails to endorse the amendment as being minor then it automatically is recategorized as major unless MNR determines the objective is frivolous or vexatious. We are satisfied that the requirement for the district manager to consult with the LCC before categorizing amendments will prevent any problems with our approved process or at least bring problems to light. We did not receive evidence to show that MNR has deliberately miscategorized major amendments as minor. We are requiring a record of the LCC input on deciding the categories of Plan amendments to be included in the State of the Forest Report (Appendix 22), so if there is frequent disagreement this will be apparent. The Minister of Environment and Energy will then be in a position to take suitable action and change the amendment process when our approval is reviewed. In the

meantime, MOEE has the responsibility and the legal power to enforce compliance with this Approval.

Planning for Insect Pest Management Programs

Among MNR's options for managing insects, the most controversial is chemical insecticide. The Minister of Natural Resources imposed a "moratorium" in 1985 and since then MNR has permitted aerial spray only of *Bacillus thuringiensis* (B.t.), a biological alternative to chemical insecticides such as carbaryl and fenitrothion.

In Chapter 7 we discuss the regulation and use of chemical pesticides. In Chapter 7 we also discuss the use of chemical herbicides for tending, which is a timber management activity requiring approval in the five-year Plan.

Annual Work Schedule

The approved Timber Management Plan gives the public a picture of the timber operations planned for five years, but it is in the Annual Work Schedule (AWS) where the public learns exactly which timber operations will be carried out by these specific treatment methods by stand location. The statistical summary (p. 21) gives an idea of the size of these operations carried out in 1990/91.

OFIA argued that requiring individual stand listings in the AWS creates repetitious and unnecessary paper work but we are convinced that the stand listing is essential in the Plan and the AWS. Stand listings and maps make the AWS a "stand-alone" document and something more accessible to the public than the entire Plan. Listings contain the operational prescriptions for stands in Areas of Concern and, therefore, help MNR prepare cut approvals and areas inspections.

No timber operations are allowed to proceed until the AWS is prepared and all activities identified in the AWS must be previously approved in the Plan, an amendment or insect pest management program. Public scrutiny is provided by the Local Citizens Committee's inspection of the AWS before the district manager approves it. The Notice of AWS Inspection must be issued at least 15 days before the timber operations are scheduled to begin.

The AWS is not designed as a public consultation forum to resolve conflicts in timber management planning: solutions to public complaints need to be found during the planning

process. We are satisfied that Condition 72 and provisions for notice in Appendices 2, 3 and 4 provide the public with certainty that timber operations carried out in any year have already been approved within the timber management planning process.

Prescribed Burns

MNR alone is authorized to conduct controlled burns for timber management planning in the area of the undertaking as a method of preparing sites for natural and artificial regeneration. We discuss the use of prescribed burning as a tending method in Chapter 6.

MNR's proposal on prescribed burning was undisputed at the hearing and no other party led evidence on it. We accept the parties' agreement on Condition 73 and Appendix 16. Planning for prescribed burns will involve developing an operational Plan describing the technical measures for protecting public safety and preventing escape fires, consideration of AOCs and analysis of potential effects on forest values and post-burn reports. Each prescribed burn requires approval by the district manager and regional director and the operational plans for each burn will be part of the AWS. We accept the clarification of OFIA making Appendix 16 state explicitly that prescribed burns will be done in accordance with the procedures set out in the Prescribed Burn Planning Manual.

PLAN REVIEW AND APPROVAL

MNR has sole responsibility for approving Timber Management Plans, and also amendments and Contingency Plans, although Contingency Plans must have the endorsement of MOEE's Environmental Assessment Branch before they can be prepared.

Condition 61 requires the district manager to certify that the Plan accords with the Timber Management Planning Manual and the appropriate implementation manuals, with reasons for any exceptions spelled out. The district manager must consider other policies and obligations such as integrated resource management and those relating to Aboriginal people. MNR District Offices will be required to keep updated information on Ontario government policies relating to native people.

Beginning with the submission of the draft Plan to the district manager (after the first information centre), MNR's formal review process is scheduled to take about six months. This allows for review by the district and region, then the second information centre where the public can see MNR's preliminary list of required alterations to the Plan and suggest

their own and at last the final stage in which the public inspects the approved Plan and sees how the alterations were incorporated.

In ordering Condition 62, we looked carefully at the evidence on the details of MNR's review process (Ex. 813A; trans: vol. 139, pp. 23596-716) to assure ourselves that it is more than a "rubber-stamping" of the efforts of the Plan author and planning team. We consider this review to be important as a truly thorough check that each Plan meets the requirements of this Approval.

The purpose of the district review is to ensure that the timber operations in the Plan are based on sound forestry practices, that other forest values and public concerns have been considered and the contents of the Plans are checked and verified for completeness, accuracy and consistency. The purpose of the regional review is to co-ordinate resource management on matters such as wood supply, nursery stock demands, application of non-timber guidelines, road-use management strategies and conforming to the requirements of the Class EA. Originally, MNR planned a Head Office review, but we are satisfied that the review at the regional level will be sufficient.

We support MNR's recent management changes and their definition of these as "pursuing a policy agenda which is more holistic in outlook and recognizes a greater range of resource values" (Ex. 2309, p. 40). MNR's new organizational structure and devolving management approaches reinforce our view that the creation of provincial and regional stakeholders advisory groups (Condition 4) are essential to fostering more integrated resources decision making while achieving the purpose of supplying timber to our forest industry.

CHAPTER 4

PLANNING FOREST ACCESS ROADS

INTRODUCTION

MNR estimates that approximately 33,000 kilometres of roads have been built in the Area of the Undertaking for timber management purposes (Ex. 682, MNR Panel #14 Witness Statement, p. 108). In 1987, only 4% of the wood was moved by river or lake drives and 12% by railway, while 84% was transported by road (Ex. 690). To our surprise no map existed showing the forest road network but MNR took considerable effort in producing one at our request (Ex. 2294A and Ex. 2294B). Primary roads are built to engineering specifications as permanent roads and their locations are planned 20 years into the future. These are essentially two-lane gravel roads which can carry heavy loads of up to 80,000 tons. Secondary roads are also built to engineering specification as semi-permanent roads, usually one lane with provision for passing and are all-weather. They are planned five years into the future. On average, 25 primary and secondary roads of various size are required for one forest management unit in a five-year Plan (Response to Board Interrogatory 158). They are planned with a close eye to the location of eligible harvest areas. Tertiary roads are temporary trails built for access to individual timber stands for harvest and renewal (Ex. 682, p. 118). There is no engineering standard for tertiary roads. Essentially any road passable by a loaded haul truck is acceptable (Ex. 682, p. 121). Some are planted and some are left to regenerate naturally. They are planned in the annual work schedule.

The Ontario government, including the contribution of some federal funding (Response to Board Interrogatory 149) spent over \$400 million on the construction and maintenance of forest access roads from 1980 to 1992 (Ex. 682, pp. 65, 112-13 and update provided by MNR in Questions 42 and 43; Ex. 1046, p. 22 and update provided by OFIA Question 8). The forest industry claims that it spent money of its own on building and maintaining roads and we have evidence showing that the industry's spending (net of government expenditures or payment through the FMA program) was about \$14 million in 1983, \$17 million in 1985 and \$47 million in 1990 (Ex. 1046, p. 22 and update provided by OFIA Question 8). Between 1980 and 1987 an average of 1,700 kilometres of forest access roads per year were built or reconstructed by MNR or under cost-sharing agreement with other parties (Ex. 682, MNR Panel 14 Witness Statement, p. 65) but government funding declined, allowing for construction of only 800 kilometres in 1988/89. Road payments through the FMA program

ceased in 1990/91 because of Ontario's fiscal constraints and MNR's decision to place a higher priority on the silvicultural component of the FMA program. It is MNR's view that the incentive of FMA road funding accessed significantly more older timber than would have occurred otherwise (Board Interrogatory 151).

The large investment of taxpayers' dollars adds to the public feeling of entitlement to use forest roads on public land. Except for the restrictions and the related controversy as we discuss below, public access is permitted on 80% of these roads.

MNR told us that in the short term, the Area of the Undertaking is sufficiently accessed to satisfy timber management purposes, but they will not predict requirements beyond five years (Board Interrogatory 151). The conclusion we draw from the map of the road network is that most of the area of the undertaking now has roads nearby which suggests to us that there will be less road building in the future. Even supposing fewer roads, we expect their planning and construction will meet with increasing public concern and scrutiny as other users demand to share the forest with timber interests.

POTENTIAL ENVIRONMENTAL EFFECTS

Erosion and Sedimentation

MNR witnesses told us that the timber operation most likely to cause erosion is road building (trans: vol. 78, p. 13158) and the greatest potential for sedimentation of waterbodies arises during construction of water crossings (trans: vol. 81, pp. 13525). The sedimentation of spawning areas and the blockage of fish migration routes were identified as the principal concerns by Neville Ward, a fisheries biologist for MNR (trans: vol. 119, p. 19892). He also testified that it is possible to create or enhance fish habitat through specifically designed water crossings (trans: vol. 119, pp. 19930-32). Charles Alexander for the Coalition identified culvert size as an important factor in destroying fish habitat (trans: vol. 341, p. 59605). On our site visit to the Dryden area in 1988, Marvin Wisneski, a tourist operator and NOTOA member, showed us a culvert and expressed his concern about its effects on downstream spawning beds. We did not observe this problem on other site visits, although the parties had the opportunity to show us the worst examples of environmental damage from roads, water crossings and other timber operations. We reviewed the written evidence and photographs of FFT witnesses such as John Kapel who described past incidents of erosion and sedimentation associated with roads and water crossings (Ex. 1433A, Tab 3).

Neville Ward blames the past causes of sedimentation and blockage of fish migration routes on poorly designed or installed culverts and the erosion of fill into streams (trans: vol. 119, p. 19892). MNR is relying on its 1988 Environmental Guidelines for Access Roads and Water Crossings (Ex. 683) to address erosion and sedimentation problems caused by road construction. Mitigation measures in the guidelines to prevent erosion or intercept sediment before it enters water include seeding slopes, using rip rap, installing drainage ditches along road beds and diverting drainage water into the forest to filter out eroding material. MNR avoids building roads over water where it is practical or reasonable because of these potential effects. Water crossings are also expensive, with detailed planning required.

Wildlife

David Hogg, a wildlife program adviser for MNR, testified that road construction, maintenance and use have the potential for destroying specific habitat features and altering general habitat through influences on soil, water quality and creation of forest openings (Ex. 682, p. 247).

MNR submits that forest roads have limited direct impact on wildlife habitat, although some individual animals are killed by vehicles. MNR identifies the use of forest roads by hunters and trappers as the cause of most wildlife problems associated with access.

Mr. Hogg explained how MNR plans to avoid, minimize or mitigate the possible effects of roads on wildlife. Guidelines require MNR to avoid construction in wetlands, avoid breeding areas and breeding times and follow good road construction practices such as regenerating rights-of-way beside roads and minimizing road width (trans: vol. 119, pp. 19979-80). He also testified that wildlife habitat can be identified on the values maps and protected through the Area of Concern planning process. There is also provision for habitat protection related to road access in the guidelines for moose, fish habitat, roads and water crossings.

On the issue of excessive hunting or trapping associated with forest roads, MNR said it usually prefers placing direct controls on wildlife harvesting, rather than using road closures or restrictions. MNR's use of a moose tag quota system is unpopular with hunters and we received evidence from the OFAH showing that the number of moose tags declined from 44,830 in 1984 to 34,215 in 1988 (trans: vol. 105, pp. 17682-83).

Social and Economic Impacts

Forest roads present both negative and positive effects for non-timber users. Here is a sampling of the evidence we were presented:

- Building roads can disrupt habitat or destroy prime trapping areas. Other trappers, however, benefit from easier access to their traplines (Ex. 682, MNR Panel 14 Witness Statement, p. 361).
- Anglers and hunters also benefit from roads but the result can be excessive hunting and fishing pressure.
- Some tourist operators depend on road access, as do cottage owners (Ex. 682, MNR Panel 14 Witness Statement, p. 365).
- Road building has a potential for damaging cultural and heritage sites, mostly near water. In Condition 54, we order MNR to ensure careful and accurate flagging to identify road corridors and other locations such as reserves. Timber Management Guidelines for the Protection of Cultural Heritage Values were finalized by MNR in 1991 (Ex. 530). MNR prepared these guidelines with the advice and assistance of a number of organizations including the Society for Industrial Archaeology, the Association of Heritage Consultants, the Ontario Archaeology Society, the Ontario Ministry of Culture and Communications, NAN and GCT #3.
- Roads can disrupt the lifestyles of previously remote Aboriginal communities but we have evidence that some of these communities may want the road (trans: vol. 317, pp. 55977, 56038, 56055; Ex. 682, p. 424). Condition 50 of our approval requires input from native communities when MNR plans road corridors in their proximity.
- Northern municipalities want more roads and we have addressed the proposals of the Northern Ontario Associated Chambers of Commerce and the Canadian Association of Single Industry Towns that forest roads should be used to generate other economic development by provision of timber management planning notices to Chambers of Commerce and identification on the values maps of "existing and planned infrastructure features and other significant economic development."
- For remote tourist operators and for the preservation of wilderness areas, road access has significant potential adverse effects and we discuss these below on pp. 133-134.

INTERVENORS' PROPOSALS

Water Crossings

MOEE submitted that the potential problem of sedimentation from washouts of water crossings, especially culverts, on abandoned roads can be prevented by removing the culverts before washout. MOEE also argued that there is an unknown number of water crossings on forest roads and little is known about the fish habitat or water quality in these streams. The guidelines for access roads and water crossings developed by MNR to address the joint mandate of fish habitat (MNR's responsibility) and water quality (MOEE's responsibility) minimize the environmental impacts of road construction and maintenance in MOEE's view, but are deficient in planning the removal of unsafe culverts as part of road abandonment. We received evidence about MNR's efforts to remove or repair bridges (trans: vol. 118, p. 19823). MOEE's concern seems to be mostly with washouts of culverts.

A road is abandoned when MNR stops maintenance on it. "Physically" abandoned roads are made impassable through impediments such as berms or removal of the first culverts. The guidelines require appropriate measures to prevent significant erosion and sedimentation of waterbodies but not the mandatory removal of water crossings (Ex. 683, p. 11). "Naturally" abandoned roads are left to deteriorate but are inspected every three years or more frequently in circumstances such as abnormal rainfall (Ex. 683, p. 11). In MOEE's view, these measures are inadequate for dealing with the potential impacts of washouts. We observe that it is likely impossible to prevent all washouts through monitoring and other measures with uncontrollable factors at work such as beaver dams and heavy rainfall.

MNR takes the position that the potential for washout should not be the sole determining factor for removal of water crossings. In its view, mitigative action should be determined by assessing the impacts that removing culverts and bridges would have on road users (i.e., trappers, anglers, hunters, Aboriginal people) and on fire control and mining exploration, the impacts of the possible washout if there are no fisheries values in the vicinity, the erosion and sedimentation that can occur from removing the water crossing and the availability of funding (trans: vol. 130, pp. 22090-99).

MOEE and MNR agree on Conditions 52(d) and 53 that a determination of water crossing removal will be made during timber management planning of primary and secondary roads traversing Areas of Concern and this information will be documented in the Plan. MNR, MOEE and the forest industry are forming a committee of technical experts to develop a set of criteria based on engineering, safety, water quality and biological factors that will be

considered in future decisions to remove water crossings. Until these criteria are developed and implemented with its concurrence, MOE proposes the mandatory removal of water crossings on abandoned roads prior to washout.

We share MOEE's concern about the potential adverse impact of sedimentation from washouts but we have no evidence on the number of abandoned roads, (trans: vol. 372, p. 64706), the number of culverts on these roads or whether an actual problem with washouts is occurring. MOEE agrees that removal is not required if a water crossing is functioning satisfactorily (Ex. 2200, p. 28). For these reasons we are not persuaded that the interim measure proposed by MOEE is necessary. MOEE agrees the long term solution is for itself, MNR and the forest industry to make decisions about removing water crossings based on agreed criteria. We are ordering in Condition 52(e) that MNR work with MOEE and the industry to develop these criteria, based on factors such as biological, engineering, water quality and safety concerns, within two years and we are requiring progress reports to the Legislature on this work. We are also ordering MNR in Condition 78(b)(i) to report incidents of washout in Areas of Concern and their observed environmental impacts in area inspection reports so that the extent of any problems will be identified and recorded. Because the potential for environmental damage is serious but the extent of the problem is unclear, we are also requiring that incidents of washouts of water crossings on access roads in Areas of Concern be included in the Annual Report on Timber Management to the Legislature (Condition 82 and Appendix 20).

Public Access

Northern residents told us they are entitled to use forest roads for hunting, fishing and recreation because the roads were built on public lands largely with taxpayers' dollars. MNR's position, supported by OFIA, is that forest roads should be open to the public unless there are good reasons to restrict access, by signs and less often by gates, either permanently or seasonally. The principal opponents to public access were remote tourist operators who are concerned about losing their fly-in business when a remote lake where they operate is accessed by road, and wilderness supporters who believe the physical and aesthetic features of the wilderness are destroyed by road building and the traffic that follows. MNR said other reasons for closing roads include public safety and protection of road surfaces during spring breakup.

MNR told us that 3,642 kilometres of forest roads are closed to public access, at least for part of each year. Nearly half of the total – 1,546 kilometres – is in Algonquin Park District, leaving 2,096 kilometres of restricted roads in the rest of the Area of the

Undertaking. This is roughly 10% of the 20,000 kilometres total of forest access roads used in any given year (out of the total 33,000 kilometre network) (Response to Board Interrogatory 155). The overall problem looks small compared to the size of the road network, but the issue is magnified in some districts such as Ignace, Kenora and Hearst, each of which has at least 200 kilometres in restricted roads.

One solution was proposed by Dr. Bruce Hodgins, a witness for Northwatch, who believes that the public must be educated in the benefits of preserving wilderness so that restricted road access is acceptable to them and MNR must be forced to build fewer roads and enforce penalties against trespasses. Mr. Hodgins identified the problem we heard about from many tourist operators: the construction of secondary and especially tertiary roads near shorelines giving the opportunity for all-terrain vehicles to make illegal trails onto lakes. Nothing can be done to prevent determined drivers of such vehicles from going off the legal roads except close surveillance but, in our opinion, it is unrealistic to assume that MNR could ever afford to patrol the forest against this activity.

MNR does not gather information on how much the public uses forest roads but we do have statistics in evidence showing that 808 charges were laid under the *Public Lands Act* for trespassing on restricted roads between 1985 and 1992. Almost half of these charges were laid in the MNR districts of Algonquin Park, Thunder Bay and Blind River and none in twelve districts (Board Interrogatory 154). While some claim that MNR's enforcement is lax, we have no evidence to support this. We believe solutions must be found in better planning for locating roads away from water, where restrictions are less likely to be required.

MNR argues that decisions about restricting public access on forest roads are best left to the examination of alternative road corridors during timber management planning and the design of use management strategies for each situation. We heard many complaints from the public and remote tourist operators in particular that this approach is not working.

MOEE highlighted in its case the concern about public access, which produces the greatest number of bump-up requests. We agree with MOEE that roads should be planned in a way that will avoid access restriction conflicts *after* the Plan is implemented. MOEE proposes that road planning must include at least one alternative corridor that will not restrict access to the general public. This proposal sounds too simplistic because we have MNR's agreement that if there were a reasonable and practical road corridor they would certainly evaluate it and all things being equal would pick a corridor that did not require restrictions. Practically, we know that such choices are not available in every instance. There may be physical limitations such as the existence of only one land corridor between two lakes or the need to protect a remote forest operator's business or some other non-timber value. We

see merit, however, in MOEE's proposal that there be documentation in every Plan that MNR has considered a road alternative to serve the public.

Our Condition 49(c) requires that in each Plan where the selected primary and secondary road corridors require restrictions on public access, the reasons for this must be fully explained. We reject MOE's proposal that the evaluation of alternatives must always include one road alternative that will not restrict access to the general public. In our view, we have MNR's commitment to do this wherever it is feasible. Where road restrictions are unavoidable, evaluating such an alternative is, in our opinion, an unproductive exercise. By requiring documentation of the reasons in the Plan for selecting a road corridor that restricts access, we will give the public a chance to influence and understand what went into the decision through the work of the Local Citizens Committee and review of the draft Plan. The public will be notified before the road is built that their access will be restricted and the reasons for it. The Provincial Annual to the Legislature (Appendix 20) will show how many kilometres of roads are constructed, maintained, gated, signed or abandoned each year.

The "No Road" Option

FFT proposes that MNR consider the "no road option" as the do nothing or null alternative to be assessed, among others, in timber management planning for primary and secondary road corridors. FFT argues that consideration of the null alternative is required under s. 5(3) of the *Environmental Assessment Act* for each Plan.

MNR argues that approval of the Class EA settles the question of the need for timber management planning and it does not have to be revisited in each Plan. MNR concludes that an analysis of the null alternative for access is a reconsideration of the need to proceed with harvest and subsequent timber operations.

We accept MNR's view that the activities of planning access and harvesting are inseparable – roads are built during timber management planning for the purpose of accessing timber. In Chapter 2, on p. 58 we determined that the need for the forest industry has been demonstrated for the province and for timber management planning for forest management units.

We cannot accept, however, that MNR would proceed to plan and build roads without explaining why. In fact, MNR proposed late in the hearing that each Plan will contain an explicit statement giving the reasons why each proposed primary and secondary road is

required. This statement is required by Conditions 31(a) and 48(a). We understand that these reasons will be associated with the level of harvest renewal and tending forecast in the Plan.

Roadless Wilderness Areas

FFT proposes that MNR identify all the roadless areas in each forest management unit and manage these as wilderness. No primary or secondary roads would be permitted unless certain conditions are met (the road must not significantly affect biological diversity, water quality and non-timber values). All roads that are built would be revegetated within five years unless necessity and the rationale for a permanent road are set forth in the Plan.

FFT argues that there is public support for roadless areas. It said people value wilderness recreation, solitude, maintenance of biodiversity and a range of other ecological, scientific and socio-economic benefits. Zane Smith, an official of the U.S. Forest Service who testified for FFT, said 17 percent of the U.S. National Forests is set aside under the terms of the 1964 Wilderness Act. Mr. Smith said those wilderness areas "are managed so that there is as little as practical human influence on them" and provide "the opportunity for research in a basically unmanipulated landscape and vegetation" (trans: vol: 298, p. 53098). Peggy Walsh Craig, a witness for Northwatch, spoke about how the wilderness provides her with immeasurable spiritual renewal and inspiration (Ex. 2179). Vicki Mather, a witness at the North Bay community hearing proposed that 5% to 10% of each FMU remain roadless.

FFT submitted that the adverse impacts of forest roads can be avoided by keeping certain areas free of roads. FFT counsel also argued that requiring MNR to evaluate roadless areas will ensure that the environmental impacts of new access roads will be thoroughly and publicly assessed. Northwatch supported FFT's roadless area proposals.

FFT did not give us a workable definition of roadless areas. Are these synonymous with wilderness, ecological reserves or protected areas? Why should wilderness areas exclude ANSIs, provincial parks or an area designated under the *Wilderness Areas Act*? We observe on the map of the road network that there remain some large areas unaccessed in the northern and northwestern parts of the area of the undertaking. Is a roadless area the size of 1 hectare, 1 square kilometre or 100 square kilometres? How can decisions be made about setting aside wilderness areas without deciding their purpose? How can decisions about wilderness areas be made separately within each forest management unit, in isolation from regional or provincial needs or objectives? Which activities would be compatible with

the objectives of roadless wilderness areas – remote tourist operations, cottages, fire protection, insect management, hunting?

We agree with FFT that wilderness preservation is an important objective, but in our opinion roadless wilderness areas are a matter of provincial interest comparable to the timber management decisions that need to be made about landscape management and biological diversity. Also, more information is needed. We are ordering Condition 106 requiring MNR to develop a provincial policy on roadless wilderness areas by 1997. Appendix 20 requires MNR to report progress on this issue annually to the Legislature.

Planning Road Access beyond 20 Years

We looked to the partnership of the OFAH and NOTOA, who joined forces as a coalition during the hearing in June 1991, for a better solution to forest road access. They had been seen as adversaries on this issue.

We carefully considered the evidence of the Coalition's witnesses, Bud Dickson, Robert Stewart and Dr. Terry Quinney (Ex. 2128) on long-term planning for roads. Ideally, the Coalition wants roads to be planned for the "full rotation periods" (i.e., 80 to 100 years) as MNR does for predicting wood supply. MNR and OFIA objected that a time-frame exceeding 20 years is impractical and unreasonable because of the unpredictable effects of fires, blow-downs, insects and industry demand on timber management planning. The Coalition argued that just as long-term wood supply forecast must be changed and adapted to new circumstances so must road planning.

We accept the Coalition's view that conflicts over road planning might be reduced if tourist operators could invest in and manage their businesses with some certainty of how road access will affect them beyond five years and even 20 years. The advantages to other forest users are also apparent.

We are unconvinced of the feasibility of the formal, detailed, full rotation access plans proposed by the Coalition. The effect of this proposal would be of limited guidance to forest users because predictions made beyond 20 years can change dramatically and cannot be construed as a guarantee or insurance that the road corridors will actually be built where forecast. Parties affected by the uncertainty of timber management planning are asking MNR to give them as much advance warning as can be reasonably provided and we find that the road planning time frame cannot be predictably extended beyond 20 years as described in Condition 30(a).

FINDINGS

We are persuaded by the evidence that the environmental effects associated with the construction and maintenance of forest roads can be effectively prevented, minimized or mitigated through the use of Implementation Manuals, particularly the Environmental Guidelines for Access Roads and Water Crossings (Ex. 683) and the Code of Practice for Timber Management in Riparian Areas (Ex. 434). Conditions 30 to 33 and 46 to 52 of our approval require MNR to follow road planning procedures involving adequate public consultation and documentation and analyses of alternatives. The road planning process we are approving will stage the planning of primary roads for 20 years beginning with an analysis of alternative 1 kilometre-wide corridors. This narrows in the five-year Plan to an analysis of alternative 500 m-wide corridors within which the primary and secondary roads will be built. For roads in Areas of Concern we are satisfied with the evaluation of alternative 100 m-wide road locations and special analyses. Condition 53 requires certain restrictions on tertiary roads that will give directly affected parties such as remote tourist operators the opportunity to verify the location of tertiary roads in advance of their construction.

- 30. (a) Each Timber Management Plan shall contain the selected corridor for each new primary road which will be required to provide access to and within areas eligible for operations (or the projected operating areas) for the 20-year period of the Timber Management Plan.
- (b) The selected primary road corridors shall be clearly identified on the "eligibility maps" in the Timber Management Plan.
- 31. (a) For each new primary road, there shall be documentation of the reasons that a primary road is required and consideration of a reasonable range of practical alternative one-kilometre-wide corridors.
- (b) In identifying a reasonable range of practical alternatives for evaluation, there shall be consideration and documentation of the following factors:
 - (i) the degree to which the physical conditions present in the area act as constraints or provide opportunities;
 - (ii) the degree to which non-timber values present in the area act as constraints or provide opportunities, including possibilities for development of other resources;
 - (iii) any significant engineering or safety factors; and

- (iv) any other planning processes dealing with access in the area, including but not limited to planning of hydro transmission and pipeline corridors, access to hydro-electric generating sites, establishment of potential cottage and recreation areas.
- 32. (a) For each corridor identified in accordance with Condition 31(b), there shall be an evaluation of the following parameters which shall be documented:
 - (i) an assessment of the advantages and disadvantages of that alternative for timber management purposes, in providing access to and within areas eligible for harvest, renewal and tending operations for the 20-year period of the Plan;
 - (ii) an assessment of the advantages and disadvantages of that alternative as they relate to potential effects on non-timber values;
 - (iii) consideration of reasonable use management strategies; factors to be considered include public access provisions or restrictions, and maintenance provisions and, where appropriate, abandonment provisions; and
 - (iv) an estimate of costs related to road construction and use management, including a projection of maintenance costs and, where appropriate, abandonment costs.
- (b) The selection of a corridor from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the corridor and associated use management strategy shall be provided.
- 33. Whenever a new river/lake drive is proposed, or an existing river/lake drive is proposed to be extended, for the purposes of access for timber management, the proposal shall be considered in the timber management planning process as a primary access option, and the planning requirements for primary access shall apply.
- 46. (a) Each Timber Management Plan shall contain the location of each new primary and secondary road which is required during the five-year term of the Timber Management Plan.
- (b) The selected locations of all primary and secondary roads for the five-year term shall be clearly identified on the "areas selected for operations maps" in the Timber Management Plan.
- 47. For each primary road corridor selected in accordance with Condition 32, the corridor required for the five-year term of the Timber Management Plan shall be refined to a 500-metre wide road corridor. A specific location shall also be determined in each Area of Concern traversed by the corridor, in accordance with Conditions 51 and 52.

48. (a) For each new secondary road, there shall be documentation of the reasons that a secondary road is required, and consideration of a reasonable range of practical alternative 500 metre-wide corridors.
- (b) In identifying a reasonable range of practical alternatives for evaluation, the requirements of Condition 31(b) shall apply.
49. (a) For each corridor identified in accordance with Condition 48(b), there shall be an evaluation of the following parameters which shall be documented:
- (i) an assessment of the advantages and disadvantages of that alternative for timber management purposes, in providing access to and within areas selected for harvest, renewal and tending operations for the five-year term of the Plan;
 - (ii) an assessment of the advantages and disadvantages of that alternative as they relate to potential effects on non-timber values;
 - (iii) consideration of reasonable use management strategies; factors to be considered include public access provisions or restrictions, and maintenance provisions and, where appropriate, abandonment provisions; and
 - (iv) an estimate of costs related to road construction and use management, including a projection of maintenance costs and, where appropriate, abandonment costs.
- (b) The selection of a corridor from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the corridor and associated use management strategy shall be provided.
- (c) Where the preferred use management strategy will require the restriction of public access on primary and secondary roads, the Timber Management Plan shall state why.
- (d) For each secondary road corridor selected in accordance with Condition 49(b), a specific road location shall also be determined in each Area of Concern traversed by the corridor, in accordance with Condition 52.
50. In the planning of primary and secondary road corridors, where alternative corridors will create access to remote native communities not previously accessible by road, or will result in an increase in the accessibility of such communities, the analysis shall include an assessment of the advantages and disadvantages to the remote communities of the change in accessibility. The assessment shall include input from the specific communities.
51. (a) In each case where a primary or secondary road corridor selected in accordance with Conditions 32 or 49 traverses an Area of Concern, there shall

be consideration of a reasonable range of practical alternative 100 metre-wide road locations in the Area of Concern.

- (b) In identifying a reasonable range of practical alternatives for evaluation, the requirements of Condition 31(b) shall apply.

- 52. (a) For each road location identified in accordance with Condition 51(b) there shall be an evaluation of the following parameters, which shall be documented:

- (i) identification of the potential environmental effects on the value(s) present in the Area of Concern; and

- (ii) identification of potential preventive and mitigative measures.

- (b) The selection of the road location from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the road location shall be provided.

- (c) The selected road location in the Area of Concern shall be clearly identified on the "areas selected for operations maps" in the Timber Management Plan.

- (d) Where it has been determined that the primary or secondary road which traverses the Area of Concern is likely to be abandoned, if there is a water crossing in the Area of Concern there shall be a determination as to whether the water crossing is likely to require removal. That determination shall be based on biological, engineering, water quality and safety criteria. Relevant information to be considered at the time of issuance of construction approvals and work permits shall be provided in the Timber Management Plan.

- (e) MNR shall form a committee of technical experts with the MOEE and the Industry in order to develop the biological, engineering, water quality and safety criteria referred to in Condition 52(d). These criteria shall be developed within two years of this approval.

- 53. Where tertiary roads may be constructed in areas associated with, or in proximity to, values identified on the values map, any necessary conditions on the locations, construction or use management (including water crossing removal) of those tertiary roads shall be determined. These conditions shall be documented in the Timber Management Plan and may also be portrayed on the maps of the areas selected for operations for the five-year term of the Plan. In appropriate circumstances, such conditions may involve marking or flagging of tertiary road locations prior to implementation of operations, and/or notification in advance to directly affected parties to provide an opportunity for verification of road locations in conformity with the conditions specified in the Timber Management Plan.

CHAPTER 5

HARVEST

INTRODUCTION

When most people think of timber management they equate it with harvesting. They worry about destruction of the forest by logging.

In this chapter we discuss the rules MNR uses to regulate logging, the planning process that decides how much wood will be cut and where and the public's influence on these decisions. We describe MNR's practice of sustained yield management and, after comparing it to the alternative proposed by FFT, we find that MNR's approach is better. We accept that Ontario's boreal forest contains large amounts of older age stands, which means that the level of sustainable harvest cannot be permanently fixed. It will predictably increase and decline over time. We are satisfied, however, that MNR can provide a continuous and predictable supply of wood to industry while protecting the interest of non-timber users.

Clearcutting is a major controversy and we begin our analysis of this evidence with an explanation of the biological characteristics of our boreal forest, which we find are understood poorly if at all by the public. The boreal is a "disturbance" forest created over time by natural fires, insect infestations and disease. These resulted in the large, even-aged conifer stands most highly valued by the forest industry. We are persuaded that in order to regenerate the boreal forest, MNR must use a range of clearcut sizes. In reaching this conclusion, we weigh the evidence we received on public opposition to large clearcuts, the scientific uncertainty about the impacts of small clearcuts, the demonstrated success of the Moose Habitat Guidelines in decreasing clearcut size and MNR's evidence that some large clearcuts are justified for silvicultural and regeneration reasons, such as harvesting overmature timber, salvaging insect-infested wood and providing wildlife habitat. We are ordering a restriction of 260 hectares as the upper range of clearcut sizes, a limit that is already being implemented through the Moose Guidelines. We are leaving it to the professional judgement of MNR's foresters and biologists to make exceptions to this limit for some larger clearcuts. MNR must explain to the public in the Plan the exceptional circumstances, such as need for wildlife habitat or salvage cuts after insect infestation, that would require any clearcut to exceed 260 hectares. However, 260 hectares should not

become the established choice of foresters for a harvest. A range of up to 260 hectares – based on the local conditions – should be the objective.

We looked at the potential environmental effects associated with harvesting. We are satisfied that MNR has the experience and ability to provide reasonable protection to the environment from the adverse impacts. In those instances where MNR failed to convince us their approach was preferable – such as its opposition to adding new provincial featured species, to numerical limits on clearcut size and to guidelines for visual resources – we address these concerns in our Conditions of Approval.

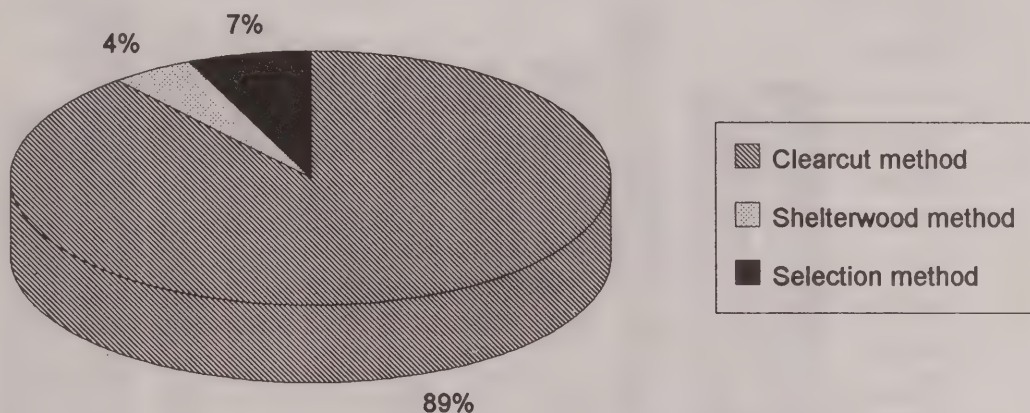
We considered FFT's proposal that MNR be required to move away from its present practice of clearcutting using artificial and natural regeneration toward reliance on a modified harvest and natural regeneration approach. We compared the costs of the two systems and, more important, the implications for wood supply, and conclude that FFT's approach would jeopardize conifer supply to industry. We also examine and reject the idea of applying the more intensive European type of plantation management for Ontario's forest.

The intervenors were successful at the hearing in focusing our attention on biodiversity conservation and landscape management. These issues influenced our decisions about the harvesting activity and we discuss our findings and Conditions of Approval in Chapter 11.

We accept MNR's extensive evidence, presented by its Panel 10 witnesses and throughout its case, that the three silvicultural harvest systems used in the Area of the Undertaking are appropriate. As shown in Figure 5.1, 89% of the harvest in 1990/91 used the even-aged clearcut system (open clearcuts, strip and block cuts, seed tree cuts and other configurations) which are suited to the conifer tree species and site conditions of Ontario's northern boreal forest. The shelterwood system (uniform and strip methods) is also an even-aged system but accounted for only 4% of the harvest. The selection system, used for about 7% of the harvest, is an uneven-aged silvicultural system suited to tree species such as maple in the Great Lakes-St. Lawrence forest. Detailed statistics on harvest methods over recent years are shown in Figure 5.2.

The size of the area harvested varies from year to year. Since 1981 it has ranged from 155,007 hectares in 1983/84 to 219,223 hectares in 1989/90 (Update of Ex. 534C, MNR Question 35 and Update of Ex. 416A, p. 89, MNR Question 25). The area of the provincial harvest from 1980/81 to 1990/91 is shown in Figure 5.3.

Figure 5.1
The Crown Land Harvest, 1990/91, by Harvest Method



Source: Update of Ex. 415A, p. 89, MNR Question 25

Figure 5.2
The Crown Land Harvest, 1986/87 - 1990/91, by Harvest Method

	1986/87		1987/88		1988/89		1990/91	
SILVICULTURAL HARVEST METHOD	Area cut (hectares)	%	Area cut (hectares)	%	Area cut (hectares)	%	Area cut (hectares)	%
Clearcut Method								
Clearcuts	175,983	87%	186,686	87%	179,576	85%	149,772	86%
Clearcuts with seed trees	2,367	1%	976	1%	4,999	2%	4,189	2%
Strip Clearcuts	1,032	1%	3,245	2%	853	1%	1,920	1%
Shelterwood Method								
Uniform shelterwood	8,511	4%	9,067	4%	11,314	5%	7,434	4%
Strip shelterwood	206	0%						
Selection Method	13,770	7%	13,873	6%	15,087	7%	11,592	7%
TOTAL	201,869	100%	213,847	100%	211,829	100%	174,907	100%

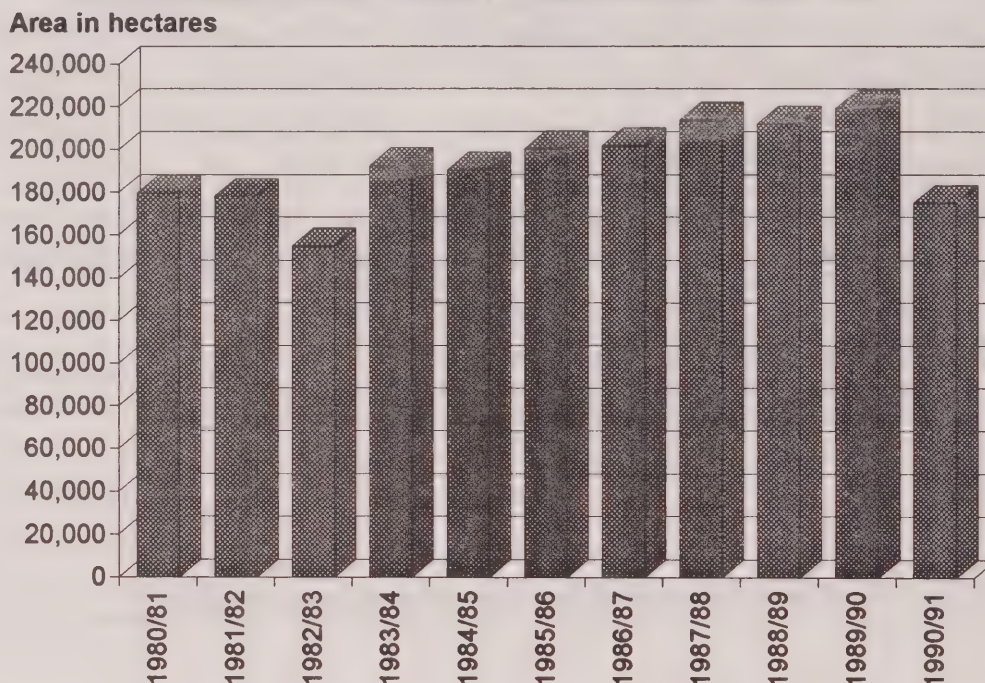
"Clearcuts" includes both clearcuts intended for artificial regeneration and those to be left for natural regeneration

"Clearcuts with seed trees" includes clearcuts with group seed trees

"Uniform shelterwood" includes only the seeding cut of the uniform shelterwood method

Source: Update of Ex. 416A, p. 89, MNR Question 25

Figure 5.3
Area of Provincial Crown Land Harvest, 1980/81 - 1990/91



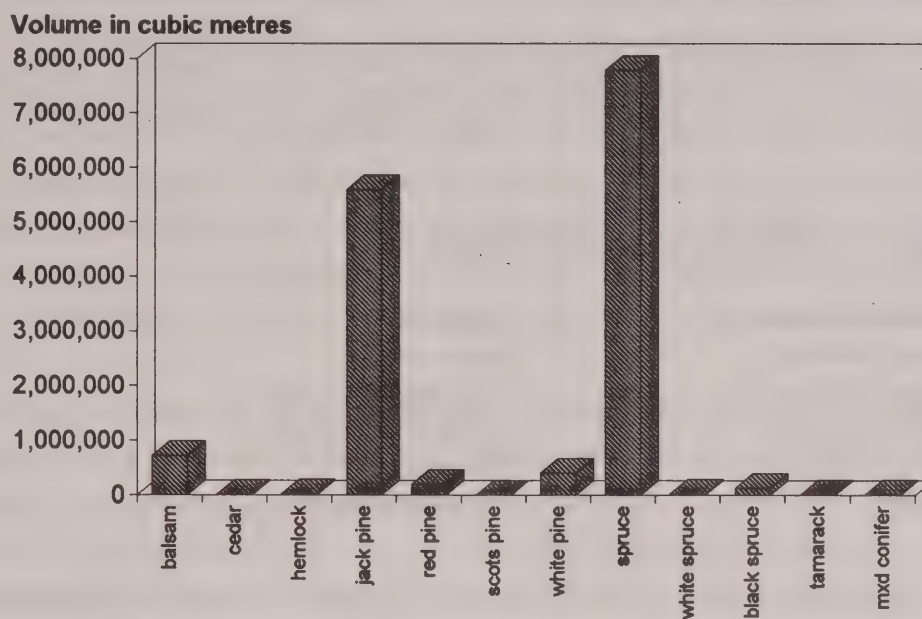
Source: Update of Ex. 534C, MNR Question 35* and Update of Ex. 416A, p. 89, MNR Question 25

*Adjusted to show harvest in fiscal year of operations rather than in following year as reported by MNR

The total volume of timber harvested on Crown Land has ranged from 20,684,001 cubic metres in 1984/85 to 17,758,392 cubic metres in 1990/91. Figures 5.4 and 5.5 show the volume of timber harvest in 1990/91 by species, for softwoods and hardwoods respectively. In 1990/91, jack pine and spruce made up about 76% of the total volume of timber harvested (Update of Ex. 604A, p. 131, MNR Question 40).

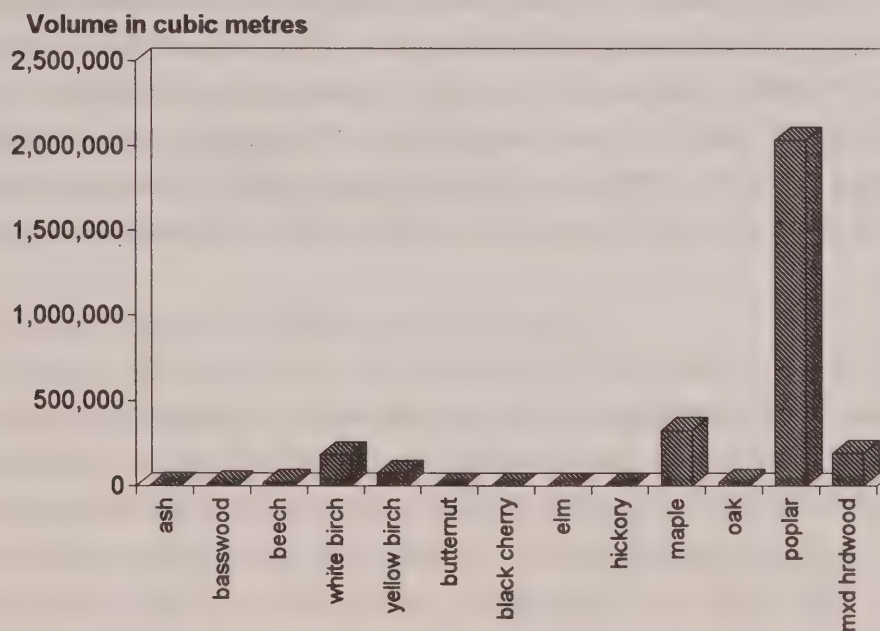
We are also persuaded by MNR's evidence that the three logging methods – tree-length, short-wood and full-tree – are acceptable (Ex. 416a, pp. 151-162). In 1989, the full-tree method accounted for 64% of logging, tree-length for 28% and short-wood for 9%. Since most logging is by the full-tree method, we require MNR to research its potential for long-term impacts on site productivity.

Figure 5.4
Softwood Timber Harvested on Crown Land by Species, 1990/91



Source: Update of Ex. 604A, p. 131, MNR Question 40, p. 2

Figure 5.5
Hardwood Timber Harvested on Crown Land by Species, 1990/91



Source: Update of Ex. 604A, p. 131, MNR Question 40, p. 2

PLANNING FOR HARVEST

The Ground Rules

For each Plan the forester will write a set of rules for conducting timber operations (Condition 25(a)). An example of the "preferred silvicultural treatment package" in the Plan would be:

Forest Unit: Spruce lowland, Site Class 2

Silvicultural System:	Clearcut
Harvest Method:	Strip cuts
Logging Method:	Full-tree chipping
Site Preparation:	Light mechanical
Regeneration:	Natural
Tending:	Juvenile spacing

Acceptable alternative silvicultural treatment packages will also be identified. MNR objected to being required to forecast the specific logging system in the five-year Plan because the identity of potential operators and the equipment at their disposal may not be known at the time of planning (Ex. 2252, p. 43). We believe this information is necessary given MOEE and FFT's concerns about full tree logging and MNR's study on the effects of full-tree harvest and chipping on forest productivity. We appreciate the uncertainty of specifying the logging method in advance, but if changes are made during the five-year Plan, this can easily be accommodated by substituting an acceptable alternative from among those identified in the preferred silvicultural treatment package as provided for in Condition 26. We agree with MNR that it is unnecessary to go through the formal Plan amendment process when the preferred silvicultural treatment package, including the logging method, is substituted by another acceptable alternative silvicultural treatment package identified in the Plan.

What sources of information does the forester use to develop the ground rules? The forester will use his or her judgement in considering local knowledge gained by years of experience of the district staff, who move less often than the foresters, and historical records kept in the district MNR office on matters such as site conditions and the results of previous treatments. The foresters are required to use the appropriate provincial Silvicultural Guides, which have been developed using scientific data for jack pine, spruce, poplar, tolerant hardwoods and white and red pine. These are part of the Implementation Manuals (Condition 25(b) and Appendix 7). If the forester decides to put in the ground rules a silvicultural treatment that does not accord with the Silvicultural Guides, the reasons for this

exception must be explained in the Plan (Condition 26(b)) and such prescriptions will be monitored (Condition 55(b)). In Chapter 8 we discuss changes that will be made to the Silvicultural Guides (Condition 94), one of which will be the development of general standard site types intended to provide a traceable link between the ground rules for each management unit and the provincial Silvicultural Guides. The issue of how the ground rules forecast in the Plan can be linked to specific geographical areas in the management unit is discussed as part of MOEE's proposals for measuring silvicultural effectiveness in Chapter 8. A third important piece of information the forester will use to develop the ground rules is the relevant forest ecosystem classification system (FEC) (Condition 25(b)), which is discussed in Chapter 11 on p. 401. We agree with MNR's initiatives in continuing the development of this system and we are ordering this work to proceed in Condition 97.

MNR is asking us to accept that environmental protection is inherent in the silvicultural ground rules. These rules will govern most timber operations, which can be described as normal timber management planning as distinguished from the area of concern process. We accept that the ground rules are based on scientific information and MNR's experience. Their adequacy will be reviewed by the Provincial Technical Committee within three years of our approval. We are persuaded that the selection and implementation of the ground rules give sufficient flexibility for forest managers to apply their judgement and experience. The public can have confidence that the treatments permitted in the ground rules have been vetted and endorsed by scientific and technical experts. If a forester should decide on a ground rule that is not approved in the provincial Silvicultural Guides, he or she must report in the Plan the reasons for doing so. The public can also comment on the development of the ground rules beginning at stage 1 of the Timber Management Planning consultation process. Additionally, representatives of the Local Citizens Committees will be involved in reviewing all changes to the Implementation Manuals (Condition 93(d)). Because of all these safeguards, we are confident that application of the silvicultural ground rules will protect the environment.

Planning Where and How Much to Harvest

MNR has a process for identifying harvest areas that it describes as "netting down" the land base. This begins with the total management unit for the 20-year term and ends up with particular stands that will be logged, tended and renewed during the five-year Plan. The level of expected timber harvest is forecast in each Plan (Condition 36).

Eligible Areas

The environmental assessment lists factors that are considered in determining the eligibility criteria for identifying areas where timber operations might occur during the 20-year term (Ex. 4, p. 130). Hartley Multamaki, a former MNR forester, described how eligibility criteria were identified for the Red Lake Plan, so that the older stands could be harvested first, balsam fir stands could be targeted for conversion to other conifer species, and saw-log quality conifers could be found in hardwood stands.

Once the 20-year eligible areas are identified, MNR maps them (Ex. 2216A) and begins planning the direction of primary road corridors.

Selection Criteria

Separate selection criteria are then developed to identify areas where operations will be carried out in the five-year Plan (Ex. 4, p. 136), as well as a "contingency area" to be available in case for some reason – a large fire, for example – some of the areas selected for operations cannot be used (Condition 39). Contingency areas have nothing to do with Contingency Plans, which are dealt with in Chapter 3 (p. 119). Ex. 853A, p. (h) spells out the difference. The selection process is guided by the Maximum Allowable Depletion (see p. 149), Areas of Concern (see p. 91) and location of access roads. The environmental assessment describes the factors normally considered in developing harvest selection criteria:

- industrial wood requirements
- age of stands
- cost of the operation, for example, to build new roads
- opportunities to harvest in areas of natural disturbance (from fire, insects, etc.)
- previous commitments such as return cuts
- physical, topographical and economic constraints on an area's operability
- need to harvest certain types of areas to achieve a particular management objective (Ex. 4, p. 139)

MOEE's Proposal for Public Consultation on Optional Harvest Areas

MOEE opposed MNR's selection of harvest areas before the first open house. Jan Seaborn, counsel for MOEE, argued that MNR is undermining the parties' agreement that the purpose of the first information centre be to give the public an opportunity to comment on background information, the evaluation of alternatives and to generate additional alternatives for consideration while MNR is developing proposals for the Plan and before decisions are made. These purposes cannot be achieved, Ms. Seaborn argued, if harvest areas are "privately selected" by MNR before the first information centre and then "simply announced to the public by way of the areas selected for operations maps." In the view of MOEE, the Stage 1 public consultation process where MNR invites the public to see the 20-year eligibility criteria and eligibility maps and the five-year selection criteria is inadequate because only a professional forester with technical knowledge of forestry principles or concepts could influence the selection of harvest areas at this stage. MOEE concludes that there is no significant public involvement in MNR's decisions about selecting areas for harvest and even the Local Citizens Committee cannot provide public involvement in this decision because MNR does not intend to present optional harvest areas to the committee. MOEE proposed that MNR show alternatives for harvest areas (a process MNR must do on its own to select five-year areas of operations from the 20-year eligibility maps) at the first information centre, consider the public input and then present the selected areas of operation in the draft Plan at the second information centre.

MNR's approach is to present the public with the areas selected for harvest and if someone objects, then the issue resolution process begins. MNR's witness Al Bisschop testified that if a concern were raised about an area selected for operations, MNR "would have to make decisions on where operations are going to occur that looks very carefully at the road requirements, that looks at how we are going to protect the values on that piece of geography so that we can make decisions about trading one operating area off against another" (trans: vol. 391, p. 67402). MNR described its approach as an efficient way of dealing with concerns; MOEE characterized it as preventing public input except in the "reactive context of the AOC constraint planning."

MNR raised three objections to MOEE's proposal. MNR argued that inviting the public to comment on the selection of harvest areas would be an improper reconsideration of land use decisions made in the District Land Use Guidelines. Our findings on the relationship between timber management planning and the district guidelines are discussed in Chapter 2. We agree with MOEE that involving the public in commenting on the selection of

harvest areas before the decision is made by MNR in no way impacts on the pre-existing designation of forestry as a permitted land use.

The second of MNR's objections is that selecting harvest areas is simply a "scheduling decision" (trans: vol. 387, p. 66617). MNR witness Frank Kennedy described the public consultation process in this respect as being one of "fine tuning" (trans: vol. 387, p. 66607). MNR argued that the public will be frustrated and misled by participating in decisions about where to harvest because the same areas would be reconsidered every five years. People may believe their participation saved an area from harvest, only to learn later that virtually all land where timber management is a permitted land use will be harvested eventually (Ex. 2254B, MNR response to MOEE Interrogatory 3, p. 5). We believe the public will be angrier if they think MNR has decided where to harvest before hearing from them. We agree with MOEE that presenting the public with a "*fait accompli*" in the form of selected harvest areas at the first information centre will make the public believe that MNR is resistant to any of their suggestions for changing proposed operations in any substantial way. The situation can be avoided if MNR considers public input before selecting harvest areas. MNR must live up to its claim in Directions '90 that the public is a trusted partner in timber management planning. The public may have good arguments for wanting harvest operations deferred for five, 10 or 15 years that are not, as MNR may fear, only blind opposition to supplying timber to industry. MNR makes the final decisions about selecting harvest operations. It is capable of accommodating the public's comments on selecting harvest areas and balancing these against its responsibility to provide a continuous and predictable supply of timber to industry.

MNR's third objection to allowing public input in selecting harvest areas is that it is an onerous task involving too much work (trans: vol. 393, pp. 67761-64). We disagree that alternate plans would have to be prepared or that additional open houses are needed.

We found merit in the positions of both ministries, so we have developed our own solution which should address their concerns. We order in Condition 34 and Appendix 4, part A, section 2(k) that MNR provide at the first information centre a mapped summary of all the areas that meet the selection criteria for harvest as identified on the areas selected for operations map (Condition 35). This mapped summary shall rank these areas in order of likelihood that they will be harvested during the period covered by the Plan being developed, giving the reasons for this priority, such as distance from existing roads, threat of insect infestation and other selection criteria. We do not expect MNR to do elaborate planning for each of these eligible areas, so the amount of extra work should not be overwhelming.

This will allow the public to provide information and arguments for changing these priorities, if they believe areas high on MNR's list should be deferred. We appreciate that MNR will not always be able to accommodate the public's preferred harvest areas but we believe that consulting with the public is necessary to build credibility for timber management planning. In our opinion, public comment on the location of harvest areas during the five-year Plan is an exercise that may result in deferring or rescheduling the logging of particular areas and does not compromise or reduce the size of eligible areas of operation over 20 years.

Areas of Concern

The AOC process, which we described in Chapter 3, leads to the identification of forest stands restricted or unavailable for harvest where the prescriptions are no-cut reserves or modified operations. In other words, some portion of the larger land base identified as eligible for harvest operations for 20 years is deleted by the consideration of AOCs in the selection of harvest areas in the five-year Plan. MNR estimates that reserves and areas of modified operations can account for up to 15% of the areas selected for operations.

Maximum Allowable Depletion

How does MNR decide the amount of wood that can be cut each year without harming the ability of the forest to replenish itself and continue to supply timber? MNR uses a mathematical calculation to determine the Maximum Allowable Depletion (MAD), the theoretical upper limit of timber that may be cut during a five-year Plan while still maintaining a sustainable wood supply for the current forest rotation (i.e., 60 to 100 years) or longer (Condition 28).

The information that goes into calculating the MAD is of two types:

- statistics on forest growth such as the forest resources inventory data by age classes for each working group/forest unit and the expected success of regeneration efforts
- statistics on forest depletions such as the rotation or cutting cycle, land used for roads and landings and natural disturbances such as fires and insect infestations

Because the forest changes, the MAD has to be recalculated every five years for each Plan. It is also calculated for 20 years and for the longer-term forest rotation. If changes take

place in the forest (i.e., its age-class structure) during the previous five years, the MAD may require changes to the timber production objectives for the management unit.

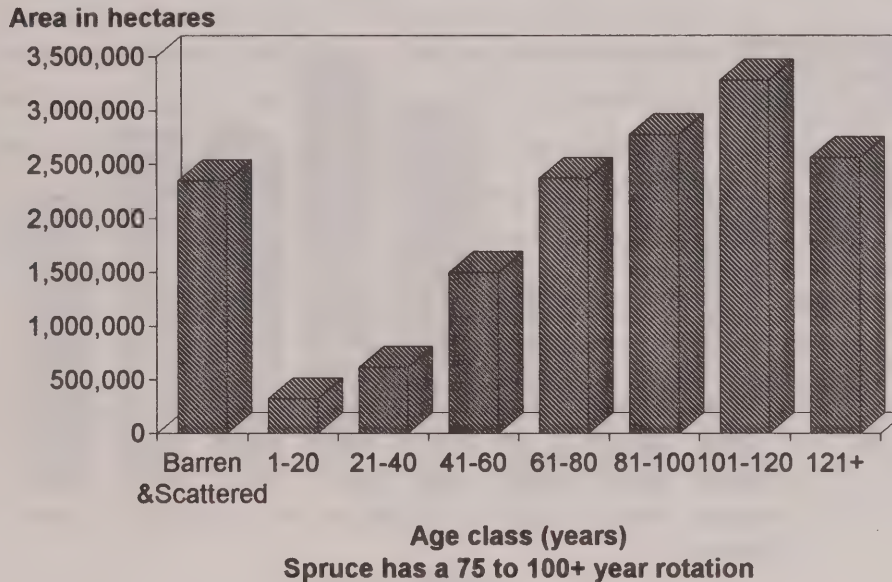
The MAD is expressed in terms of area. For example, the MAD level of forest available for harvest in the province in 1991 was 443,792 hectares. The MAD identifies the maximum possible size of the harvest area, but the forest industry needs to know these areas will provide enough volume by species of timber for the mills. The area information produced by the MAD is converted into volume information as required by the Timber Management Planning Manual (Ex. 7) for the volumes harvested by industry in the previous Plan, (Tables 4.3.1 and 4.3.2) and the volume estimates of timber available for harvest and forecast wood utilization by the mills (Tables 4.17, 4.18.1 and 4.18.2). MNR places no restrictions on other types of volume calculations that may be useful for particular Plans, so long as the MAD is also shown by area for purposes of comparing wood flows across the province and for planning other timber operations such as roads and regeneration.

THE SUSTAINABLE FOREST AND WOOD SUPPLY

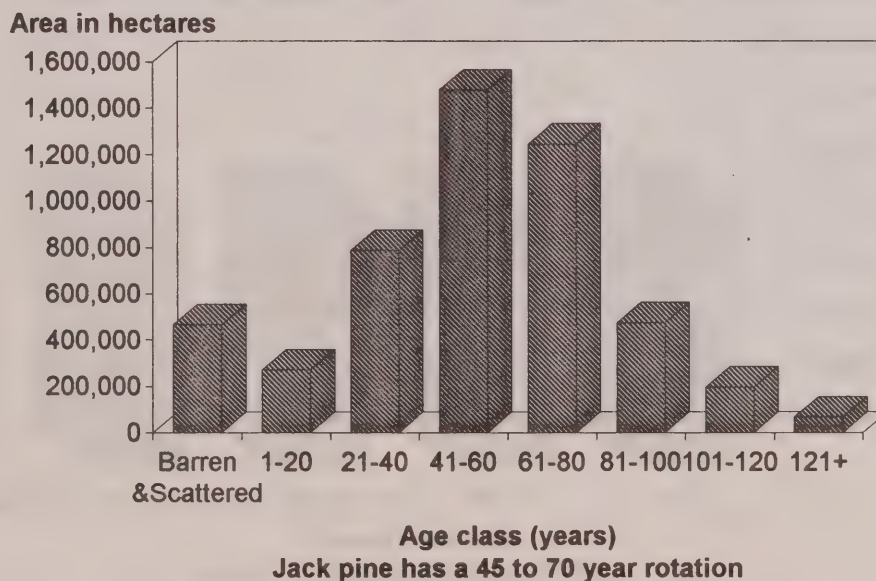
MNR's Managed Forest Objective

MNR described the forest in the Area of the Undertaking as being heavily skewed to older age classes. For spruce forests, which predominate in northern Ontario, 54% is in age classes considered mature (ready for harvest) or overmature. For jack pine, which matures faster than spruce, at least 39% could be described as mature or overmature (Ex. 56, p. 43). Figures 5.6, 5.7 and 5.8 show the age-class distributions for spruce, jack pine and all softwoods. To the foresters' way of thinking, the theoretically ideal forest is one in which there are even percentages of all age classes so that there are always younger age classes to replace the old forest that is logged. Figure 5.9 shows the age-class distributions for a theoretical "normal" forest. MNR's timber management objectives are generally designed to try to even out the age class distribution. Forest experts told us a "normal" forest is never achieved on the ground but working towards this objective provides better management control.

How does the MAD calculation figure into regulating or normalizing the forest? The MAD calculation is aimed at managing the forest toward a balanced even age structure. To do so, the MAD level will allow a lot of cutting of today's older forest and then reduce the harvest levels as its older stands are depleted. MNR points out that this "fall off" or transition during which older forests are depleted and younger stands succeed them occurs whether you harvest the wood or leave it to die from old age – it is not caused by MAD.

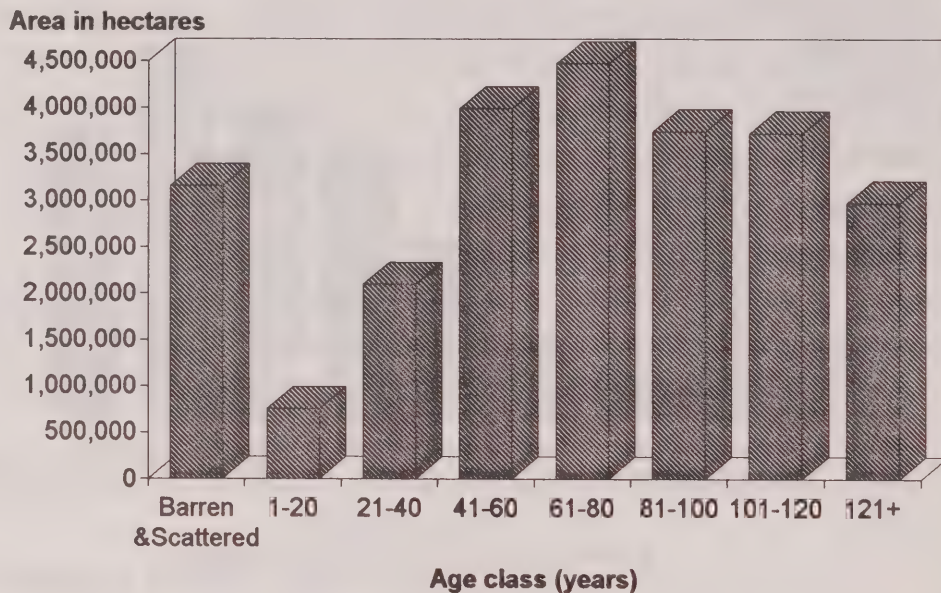
Figure 5.6**Area Distributions of Spruce for the Provincial Production Forest plus Production Forest Reserve by Age Class (as of 1985)**

Source: Ex. 56, p. 43

Figure 5.7**Area Distributions for Jack Pine for the Provincial Production Forest plus Production Forest Reserve by Age Class (as of 1985)**

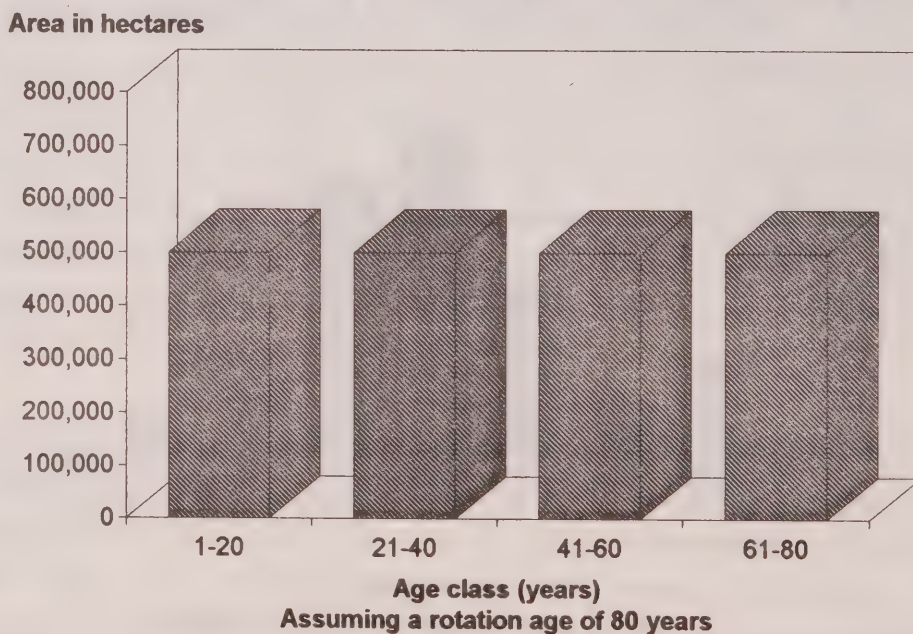
Source: Ex. 56, p. 43

Figure 5.8
Area Distributions of Softwoods for the Provincial Production Forest plus Production Forest Reserve by Age Class (as of 1985)



Source: Ex. 56, p. 43

Figure 5.9
Area Distributions for a Theoretical "Normal" or "Fully Regulated" Forest



The preponderance of older age classes in our forests means that the MAD calculations are identifying amounts of timber available for harvest today that exceed mill demand. For example, the size of the area actually harvested in 1991 was well below the forecast depletion of 330,130 hectares and less than half the 443,792 hectares permitted by the MAD.

Nickolas Saltarelli and other industry witnesses cautioned that this apparent large surplus of MAD over what in fact is being cut could be inflated because of imprecise calculation that can identify non-economic or inoperable areas as suitable for harvest (trans: vol. 188, pp. 33115-22). They argued that in spite of today's large MAD surplus some management units could be in danger of running out of wood two or three decades from now because of the transition from older age classes to a new forest.

Dr. Baskerville supported this view by pointing out that the MAD calculation will not necessarily produce an even flow of timber available for harvest year after year (trans: vol. 164, pp. 29131-32). Only after many years will the managed forest be producing new stands of each working group that are reaching rotation age at a regular pace as the decades unfold.

Does this mean that industry is facing a future wood supply shortage? We considered the situation of E.B. Eddy Forest Products Limited, which obtains about 50% of its wood from the upper and lower Spanish FMA areas. Mr. Ted Boswell, the company's president, explained to us that when E.B. Eddy entered into the Forest Management Agreement they knew that this forest, which has high amounts of mature and over-mature jack pine stands, was forecast to have a fall off in wood supply around the year 2000 as the largely natural forest was harvested. The company is confident, however, that it can manage wood supply during the transition to a managed forest and, in fact, went ahead with a \$200 million improvement of its facilities at Espanola (trans: vol. 181, p. 32085). Some of the methods to manage timber supply to the mill include increased use of poplar, higher recovery rates and higher intensity silviculture. MNR noted that about 50% of the wood used in the Espanola pulp mill now is purchased wood and this is another means of addressing the medium term wood supply shortfall (Response to Board Interrogatory 51). Mr. Boswell did advise us that E.B. Eddy's ability to manage the shortfall could be adversely affected if more of the forest land base is set aside for uses other than timber.

MNR's Definition of Sustainability

The *Crown Timber Act* requires MNR to conduct timber management in a way that sustains the forest resource. The Act defines sustained yield as "the growth of timber that a forest

can produce and that can be cut to achieve a continuous approximate balance between growth of timber and timber cut" (s. 6(2)).

MNR argues that a literal interpretation of the Act's definition of sustained yield would lead to an "absurd result." This is because Ontario's forest is imbalanced toward too much mature age timber and too little younger and intermediate age stands. As John Osborn explained to us, the annual growth rate of very old trees is negative (trans: vol. 23, p. 4076-77). Consequently, if MNR restricted harvesting to the rate of annual growth dictated by our older forest, as one interpretation of the *Crown Timber Act* would have it, the annual cut would be zero or very small. Much of the forest might deteriorate or collapse through natural disturbances before it was logged. The *Crown Timber Act* definition would also create problems, in MNR's view, for a forest that is composed of mostly young stands where the growth rate would be very high. Accelerated harvesting, matching the growth rate, would deplete the growing stock and prevent younger stands from reaching mature rotation ages. Dr. Osborn concluded that the growth of timber and the level of cutting are not equal and it is unwise to manage our forest as though they were. In a "perfectly normal forest" the growth rate and the depletions are theoretically the same but such is not the situation of Ontario's forests.

MNR submits that it practises sustained yield management. It says it can achieve the purpose of its timber management undertaking by providing a continuous and predictable supply of wood to the forest industry. MNR argues that this is not the same thing as providing a "even flow" and that while wood supply will fluctuate and deficits may be identified in certain plans for specific mills, MNR is able to forecast such problems and avoid or mitigate them. One means of addressing wood shortages, as shown in the E.B. Eddy example where the company purchases wood outside its management unit, is for MNR to redirect the system of wood flow among management units or between regions. Dr. Osborn and Mr. Armson gave us examples of other mitigation measures (trans: vol. 18, pp. 3285-89). "Storing on the stump" is action taken by foresters who are faced with the situation in a management unit, for example, where the MAD forecasts a shortfall of black spruce in 30 or 40 years. Foresters have learned that black spruce live longer on poor sites than on rich, productive sites and, therefore, logging could be concentrated on the rich sites first, saving wood on poorer sites for future logging. Another way to address a forecast supply shortage is thinning on intermediate age stands, to speed up the growth of these stands so they can replace the dwindling older age classes being logged.

FFT's Proposal for Sustainable Yield

FFT argues that MNR's use of MAD fails to meet the requirements of the *Crown Timber Act* definition of sustained yield management – namely, harvest approximately balanced with growth. They proposed to replace it with a Long Term Sustainable Yield (LTSY) and maximum sustainable harvest approach directed at obtaining a non-declining or perpetual even flow of wood volume. FFT argued that the limit of the biological capability of the forest to produce timber can be defined as a mathematical formula: $LTSY = MAI \times A$. The "MAI" is the Mean Annual Increment (a measure of forest growth determined by dividing the yield at harvest from a stand by the number of years of growth of that stand) and "A" is the productive area of the forest.

FFT argued that, while actual provincial harvests have been less than the calculated Long-Term Sustainable Yield, MNR's allowable depletion levels for specific units are set at levels that will have to decline in coming years. Crandall Benson, an expert witness for FFT, conducted what he described as an audit of 19 management units and their Plans. His conclusions criticized the MAD approach (Ex. 1604A, pp. 11-49). One of his major conclusions is that the allowable cuts in some management units are too high to sustain (Ex. 1604B, p. 158). Evidence from MNR and OFIA makes clear that accelerated cutting of older timber means that MAD levels for specific units are indeed expected to decline. But the evidence also shows that foresters are accustomed to planning for this, either by cutting less than MAD allows (trans: vol. 188, pp. 33118-20) or by getting ready to shift supply sources to other species or to neighbouring forests (trans: vol. 181, p. 32085; Board Interrogatory 51). Provincewide, for 1991 the MAD identified 443,792 hectares as available for harvest. The forecast depletion was only 330,130 hectares, and the actual harvest area recently has been less than 225,000 hectares per year, leaving a considerable margin of safety.

Professor Benson submitted that allowable cuts should be calculated on the land base that can be returned to production; we agree with MNR that the MAD does exactly this. Harvested land is removed from the MAD land base and not returned until it is assessed as being successfully regenerated by the Free-to-Grow measure (see Chapter 6). We also accept MNR's evidence that contrary to Mr. Benson's submissions, the MAD adequately accounts for the rotation ages of naturally regenerated areas and the treatment of reserves as depletions from the MAD land base (Response to Board Interrogatory 58).

Mr. Benson also went through a modelling exercise of determining the volumes of spruce in Ontario that would be available for harvest using LTSY and MAD. In comparing the

results on a provincial basis, he concluded that LTSY would allow something like an even flow of 80 million cubic metres of spruce to be harvested every five years for 115 years or longer. He said MAD would permit logging of fluctuating volumes starting at 180 million cubic metres and steadily declining to below 80 million cubic metres before increasing again (Ex. 1604A, pp. 15-38). The result of a declining harvest under MAD is exactly what MNR forecasts. Mr. Benson's even-flow results would require significant reductions in the timber harvest in some management units. Mills could face a shortfall of supply not from lack of available timber but because the theoretical LTSY limit would prevent its harvest. Much of this timber may deteriorate if not used. Mr. Benson did say however, under cross-examination by MNR counsel, that he would recommend "modification to allow for situations where it is known that older stands would become unmerchantable if not harvested and no detrimental effects to the habitat requirements of all species would occur" (trans: vol. 278, p. 50006)

FFT argues not only that the MAD approach is pushing us toward declining wood supply in the future, but that it has contributed to past overcutting, as evidenced in the Temagami district. FFT suggests that mill shut-downs in Temagami will occur in other management units under MNR's current timber management practices and the MAD fall-down effect. MNR disputes this interpretation. It attributes the decline in red and white pine timber in Temagami to the dramatic older age class distribution, due primarily to large fires in the past and more recent policy decisions to reduce the land area available for timber management. The creation of the Lady Evelyn Smoothwater Provincial Park is an example. MNR contends that this decline is not a failure to practice sustained yield management nor past overcutting or inefficient regeneration since the introduction of timber management in Temagami in the late 1950s (Board Interrogatory 61). FFT submitted that a similar pattern has occurred in the Latchford and Minden management units but we have no evidence that reliance on older age white pine sawlogs is representative of forest conditions or mills elsewhere in the Area of the Undertaking nor that it is a result of the MAD approach.

The reasons offered by Mr. Benson to explain why, in his view, the MAD calculation permits unsustainably high levels of harvest begin with his assumption that the MAD approach offends the basic concept of sustainable yield, defined as harvest equals growth. MAD predicts fluctuating and declining levels of harvest based on a "weighted areas method" that permits accelerated cutting in older age classes. This means more timber is cut in early years than can be maintained in years to come. In Mr. Benson's opinion, sustainable yields must be strictly defined as the LTSY. Mr. Benson rejects MNR's position that providing a continuous and predictable wood supply is sustainable yield. He would require the additional objective of a non-declining wood supply, which we believe ignores the reality that our forests contain a great deal of mature timber that will inevitably decline

in volume, whether by logging or natural disturbance. We accept MNR's evidence that harvest levels may go through periods of being higher and lower than today's level but that MAD can forecast these fluctuations, that MNR can address local supply shortages and that the forest resource is sustainable. More important to us than debates about theoretical definitions and interpretations is the knowledge that the timber is harvested at a pace that permits regeneration of the resource and protection of non-timber resources.

MNR demonstrated the practical problems of applying Mr. Benson's LTSY theory. Mr. Benson's long-term projection for provincial wood supply for all species concluded that Ontario's forests could sustain a harvest in the range of 25.8 million cubic metres to 34 million cubic metres annually, which is much higher than current actual harvest levels of about 20 million cubic metres of wood (Ex. 1604A, p. 65, and trans: vol. 279, pp. 50113-17). Mr. Benson's LTSY exercise in this case assumes that growth rates remain constant, that the forest will become fully regulated with a normal age class structure, that the area of forest available for timber production remains constant over time and that the entire LTSY is harvested annually. Additionally, Mr. Benson assumed that the forest could be renewed to the same species as that harvested by relying on modified harvest and natural regeneration. MNR points out that none of these assumptions or conditions actually exists in our forest. When Mr. Benson applied the same LTSY method to his audit of 19 management units, he reached the opposite conclusion of wood supply shortages, because he used real management unit information including actual, not assumed, land base and yields. MNR argues convincingly that the primary change that would come about from adopting FFT's proposal would be a switch from area-based to volume-based regulation, without any benefit to timber management in the province. We also accept MNR's arguments that there is not enough literature or experience to support Mr. Benson's modelling tool for LTSY and that the system is not appropriate for use in "unregulated," overmature forests, like Ontario's today.

MNR's Wood Supply Forecast

MNR gave us its wood supply projections based on a modelling of five scenarios (Ex. 135, pp. 264-270) and arrived at these conclusions (Board Interrogatories 48, 49 and 59):

- (1) There is enough "old forest" to meet industrial demands, even if they increase, for 50 years.
- (2) The old forest will last for a number of decades after the year 2020 and can sustain a harvest larger than 25.8 million cubic metres annually until the year 2040 (Ex. 135, pp. 50-51). MNR notes that the actual annual harvest is closer to 20 million cubic metres.

- (3) There is sufficient time to establish a new forest to meet long-term demands beyond the year 2040, but this will require a significant level of investment in regeneration, protection and tending.
- (4) Where there are potential supply shortfalls, strategies can be developed to prevent, avoid or fill any supply gaps.

Findings

We are persuaded by MNR's experience, expertise and evidence that MAD is a practical and sound approach to managing the transition from the imbalance of older age classes in Ontario's forest to more even-age management.

While we are approving MNR's sustained yield management, we have concerns about the future. FFT's case, and particularly the evidence of Mr. Benson, helped us in our deliberations by focusing attention on these uncertainties. First, we would consider it a misuse of the MAD approach if the older forest were "liquidated" solely for the purpose of supplying timber. We believe the conditions of our approval create a partnership between the public and MNR in timber management decision-making. The Area of Concern process will force a more equal sharing of the forest between timber and non-timber resources, giving better protection to the latter than we have observed was provided under past management practices. We rely on our conditions requiring MNR to develop policies on old growth and wilderness areas and to investigate the means of implementing landscape management, biodiversity conservation and habitat supply. We consider these initiatives necessary to MNR's wise management of our older forest stands and future sustainability. Our second concern about sustainability is successful regeneration. In Chapter 6, we find that artificial regeneration is essential to renewing the conifer wood required by the forest industry. Without it, we do not believe MNR can achieve the purpose of its timber management undertaking and we could not approve this application. We believe that any approach to sustained yield management of Ontario's forest cannot succeed without artificial regeneration and assisted natural regeneration. In Chapter 11, we discuss the need for MNR to prepare the long-awaited Timber Production Policy and to keep it up-to-date in the future.

THE CLEARCUT ISSUE

Introduction

We are persuaded that clearcutting is an acceptable timber management practice, particularly for the boreal forest. The boreal is a "disturbance forest," where fire, insect infestation and blowdown have created large openings in the forest, which regenerated into large, even-age stands. This is very different from the Pacific Coast forest, where clearcutting has been such an emotional issue. Dr. Dan Welsh, a biologist with the Canadian Wildlife Service, described the difference clearly:

The boreal forest of eastern Canada is catastrophe driven and is dominated by short-lived shade intolerant tree species, while the temperate coastal rainforest of the west coast of British Columbia is characterized by long-lived species and gradual turnover as individual trees die and are replaced over centuries... (Ex. 2242A, p. 4).

Circumstances are different in the Great Lakes/St. Lawrence forest. Fires were smaller and less frequent, and aging of individual trees in uneven-aged forests is a bigger factor. In this forest type, selection cutting is most common, although clearcutting is practised, for example in some even-aged hard maple stands (Ex. 416A, MNR Panel 10 Witness Statement, p. 99).

MNR's position is that, given the effectiveness of modern fire fighting, harvest is the closest available replacement for natural disturbance by fire in the boreal forests of Ontario (trans: vol. 387, p. 68121). MNR states that their main reason for clearcutting is because certain tree species such as merchantable black spruce and jack pine that grow in naturally even-aged stands require full sunlight for regeneration to maintain that even-aged forest (MNR Response to Board Interrogatory #20). OFIA supports MNR's position, and argues that over most of the Area of the Undertaking, in the absence of fires clearcutting is the only silvicultural system that will promote a return to the natural state of the forest.

Clearcut size was one of the most controversial issues at the hearing. FFT and many individuals asked us to impose strict limits on clearcut size while OFIA and MNR submitted that there is no credible evidence before us to support restricting clearcut size. Perhaps the only area of agreement among the parties on clearcuts was on the difficulty of defining exactly what should be considered a clearcut. Different definitions apply for different purposes, making it difficult to compare statistics.

The clearcut issue in Ontario is relatively new. For a long time, the supply of forest here was considered effectively limitless. New mechanized equipment introduced in the 1950s and 1960s allowed much larger cuts than ever would have been attempted before. Concerns rose that wildlife would suffer and the environment would be permanently damaged. People who saw the cuts described them as ugly gashes in the landscape and worried that the forest might never grow back. Many of these concerns eased as it became clear that regeneration could be successful in clearcuts, as described fully in Chapter 6 (pp. 212-219). But the issue continues to rage and motivated strong feelings among witnesses at this hearing.

The Comparison of Clearcut Size to Fire Disturbance

Witnesses for MNR, OFIA, FFT and independent experts interpreted fire statistics to advance their positions on clearcut size. MNR and the forest industry argued that the boreal forest was created by large wildfires and that large clearcuts are necessary to regenerate the forest to its natural state. FFT witnesses disagreed that large clearcuts are justified by Ontario's fire history.

There are problems with the fire statistics that allow differing interpretations and conclusions. Fires, as well as insect infestations and blowdowns, are unpredictable and the amount of forest lost to these natural agents of change varies greatly year to year. For example, MNR witness Joseph Churcher used statistics from the period 1977-81 to show that insects and diseases accounted for almost three times as much depletion annually as harvest in Ontario forests (trans: vol. 110, p. 18345). On the other hand, Mr. Armson stated that fire losses in any one year could be as small as a few hundred hectares or as large twice the area that is harvested (trans: vol. 12, p. 2121). MNR witness Paul Ward testified that currently, in the Area of the Undertaking, fire burns an average of 81,000 hectares annually (Ex. 2263, p. 7). These annual variations were used to advantage by the parties, who chose to average the years that would best prove their point.

There are only estimates and no solid numbers to measure the size of fires that occurred in Ontario's boreal forest in its natural state before European settlement. The parties agree that MNR's fire suppression activities have lowered the frequency and size of wildfires but dispute whether fire fighting became a factor in 1917, as MNR argues, or more recently. Mr. Ward told us that fire records are incomplete before 1970. Another problem with the fire statistics is that the parties compare data from different geographical zones. MNR's fire region is divided into "intensive" and "measured" zones where fires are actively fought and "extensive" zones, mostly north of the Area of the Undertaking, where fires are not

suppressed. We found it difficult to compare the different areas covered by the parties' data.

Here is some of what we were told:

- FFT witness Tom Hutchinson demonstrated with 1917-1987 statistics (Ex. 1412) that large fires are extreme events and the average area per fire is less than 100 hectares (Ex. 1405B, p. 3, and trans: vol. 243, pp. 43674-55).
- Paul Cassidy, counsel for OFIA, used 1969-1983 (Ex. 1419) statistics to show that 95% of all fires are under 4 hectares, demonstrating that a 100-hectare fire is as statistically rare as a 1,000-hectare fire.
- Vic Freidin, counsel for MNR, used the same statistics to argue that the average size of fire is less important than the fact that 90% of the areas burned from 1969-1983 was by fires of 200 hectares or larger (trans: vol. 245, p. 44155). Mr. Ward calculated that 90% of the areas burned in the natural forest was in fires of over 1,000 hectares (Ex. 2258, Tab. 3, p. 4).
- Roger Suffling, an FFT witness, used 1983-1987 statistics (Ex. 1729) to demonstrate that MNR is successful in suppressing small fires but largely unsuccessful in suppressing large fires over 200 hectares in size to support his argument that large clearcuts are adding to and not replacing the amount of disturbance caused by large fires.
- Crandall Benson testified that fire is still a major threat to our forests, despite increased measures of control. Displaying MNR's statistics for the period 1917-1989, he saw no downward trend in the area burned, number of fires or area per fire (Ex. 1604A, pp. 80 and 89-92).
- Paul Ward used 1976-1990 statistics showing that in the areas where MNR fights fires barely 1% of fires were larger than 200 hectares and that where fires are not suppressed more than 30% of them exceed 200 hectares (Ex. 2258, Tab. 3, p. 15). He concluded that fire suppression greatly reduces fires and therefore limiting clearcut size does not replicate nature.
- Mr. Ward presented evidence showing that the predicted frequency of fires recurring in the same area (i.e., the fire return interval) is about once every 578 years today compared to once every 65 years in the natural forest before MNR began fighting fires. He concludes that fires burned over 700,000 hectares annually in the natural forest compared to 81,000 hectares today. In his view, even if you combine today's fire loss with annual logging of less than 225,000 hectares, contemporary forest disturbance is still less than one half of the fire losses experienced annually in a natural forest.

We conclude from the fire statistics that if the size of clearcuts is to follow the pattern of naturally occurring fires, there needs to be a range of sizes with the top of the range larger than the 100-hectare limit proposed by FFT. Dr. Daniel Welsh of the Canadian Wildlife Service (Ex. 2242) and Dr. Ian Thomson (trans: vol. 383, pp. 66135-38) of Forestry Canada were particularly influential on our deliberation. We conclude that clearcuts should be made in a range of sizes to emulate natural disturbances, and that – although extremely large clearcuts would likely be rare for practical reasons – limiting clearcuts strictly to small sizes would make it impossible to regenerate the boreal forest to its natural pattern of large even-age stands.

Effects of Clearcuts Compared to Fire

Witnesses for FFT and MOEE asserted that the environmental effects of clearcuts are different from natural disturbances such as fire and that the larger the clearcut, the more damaging the effects. MNR and OFIA admit that the effects between the two are different but contend that the effects of clearcuts are no worse than those of natural disturbances and can be mitigated by silvicultural activities.

We examined the evidence on nutrient losses and we are persuaded by the evidence of Ken Armson, MNR's soil expert, that clearcutting leaves a larger pool of nutrients than does fire and that logging removes fewer nutrients from a site than does intensive fire (trans: vol. 392, p. 67521). The evidence on the effects of full-tree harvesting on site productivity are discussed on p. 405.

We agree with MNR's evidence that the effects on micro-climate, micro-site and moisture regimes from clearcutting are similar to those of fire and that the magnitude of the effects (whether beneficial or detrimental), does not either increase or decrease significantly with clearcut size (trans: vol. 393, pp. 67669-72). We are also persuaded by MNR that sedimentation and erosion from water and wind which may occur after clearcutting do not increase or decrease significantly with the size of the clearcut. Erosion and sedimentation issues are discussed more thoroughly in Chapter 4 (p. 126).

On the issue of whether large clearcuts reduce biological diversity, we believe the intervenors have identified important concerns. Much of their evidence deals with differences in the forest mosaic following clearcuts or fire. Among Dr. Ian Thomson's reasons for disagreeing with what he calls the myth that clearcutting mimics fire is that fire leaves more live and dead standing stems, residual patches of live trees and large diameter downed wood, and fires occur on areas of a few hectares to thousands of hectares in a

largely unpredictable manner over the landscape (Ex. 2240, pp. 9-10). Zane Smith, a witness for FFT, submitted that fire leaves behind a variety of live, burned and singed trees, standing and fallen, that does not look like a clearcut (trans: vol. 298, p. 53334).

Crandall Benson described how fire can burn through a forest creating a burned area of different age classes scattered around (Ex. 1604A, p. 103). Terry Carleton's studies indicate that "post-logged stands in the boreal forest of the claybelt in northeastern Ontario possess a lower floristic diversity than, and are compositionally distinct from, natural post-fire forest stands" (Ex. 2239A, p. 6).

MNR responds to these arguments with the submission that clearcuts leave vegetation on site, that substantial amounts of residual timber may be left as islands and stringers and that sloppy clearcuts can be designed to leave patches of timber. MNR does admit that clearcutting may leave less dead and downed material than fires and we discuss this on p. 178.

Other differences between the effects of clearcut and fire that emerged from the evidence include:

- seed sources are more likely to be available after fires;
- heat from fire opens cones of some conifer species, such as jack pine and black spruce;
- fire removes more of the forest vegetation and forest floor than timber harvest, which removes standing timber;
- logging equipment can cause rutting and compaction;
- roads, bridges and culverts are built for logging.

We are persuaded by MNR's evidence that through proper planning and implementation, the potential for adverse impacts of clearcuts can be minimized. We are less confident that the new forest regenerating from clearcut areas will look like the natural forest that was disturbed by fire. We have little evidence that biological diversity will be maintained or lessened. We believe this issue is much larger than the size of clearcuts and we are ordering Condition 107 requiring MNR to research the means of conserving biodiversity.

Are Clearcuts Regenerating Successfully?

FFT witnesses submitted that large clearcuts are an obstacle to natural regeneration. Crandall Benson testified that large clearcuts remove most of the seed from the cutover and create a distance larger than the effective seed dissemination range of conifers (Ex. 1604A, p. 104). George Marek's evidence was that clearcuts encourage reproduction of the low-value poplar, birch, alder and other competing plants left behind. These species would not proliferate after wildfire but may do so after clearcuts. He also described how, after clearcuts, fire-originated stands of spruce and jack pine were replaced by large stands of second growth balsam fir, which is less valuable and susceptible to budworm infestation (Ex. 1514, pp. 13-14).

MNR acknowledges that clearcutting is less likely than wildfires to prepare the forest floor for regeneration. Fires remove most of the litter layer and expose mineral soil allowing regeneration, as well as providing the heat needed to open the cones and release the seeds of jack pine and black spruce. MNR argues that this is the reason site preparation, planting and tending are needed to ensure conifer regeneration, especially on rich sites. Ken Armson testified that poor regeneration is usually explained by lack of seed source, the configuration and dimensions of clearcuts and distance to the edge, not directly by the size of the clearcut in hectares (trans: vol. 75, pp. 12685-88).

The important issue to us is whether clearcuts of all sizes are being regenerated successfully. In Chapter 6 we discuss the evidence that convinces us satisfactory regeneration on large and small clearcuts is occurring and can be demonstrated.

Information on Actual Clearcut Sizes

The size of clearcuts in the boreal forest appears to us to be getting smaller and we date this trend of declining size to the introduction of the Moose Guidelines in 1988. We discuss below the effects of the Moose Guidelines in comparison to evidence on older clearcuts.

The Timber Management Guidelines for Moose Habitat

MNR explained to us that in areas being managed for moose, and we understand that these areas cover the majority of the boreal forest, it is best to have a range of clearcut sizes, with the optimum between 80 to 130 hectares. MNR also testified that the Moose Guidelines provide habitat for approximately 70% of other vertebrate species, because these are believed to benefit from the same forest conditions (trans: vol. 83, p. 13923).

Evidence about the Moose Habitat Guidelines was presented to the hearing in a confusing – almost baffling – sequence, with corrections followed by clarifications as time passed. The clearest explanation was presented by MNR in response to Board Interrogatory No. 111:

The Moose Habitat Guidelines recommend a range of clearcut sizes (80-130 hectares) which should be the objective in areas of high moose production capability within an area being planned for timber management activities. Individual cutovers within an area of high moose production capability may exceed 130 hectares for a variety of reasons (e.g. salvage of spruce budworm damaged stands or blowdown salvage; local wood fibre shortages; previous disturbance patterns; heavy residual timber concentrations). However, as long as the majority of cuts are within the desirable range (80-130 hectares), habitat conditions will favour achieving high moose densities in the area. Where moose production capabilities are moderate, clearcut sizes of 80-130 hectares are still the objective, but individual cutover sizes may exceed 130 hectares more often than in high moose production capability areas. In low moose production capability areas, often characterized by extensive homogenous natural forest conditions, cuts may routinely exceed 130 hectares.

Irrespective of the moose production capability of any area, however, clearcuts of 260 hectares or more must be identified, recorded as an "area of concern", and a rationale must be provided for prescribing cuts of that size. This is required for two reasons. First, it ensures that the decision about cut size is made thoughtfully. Secondly it provides information for both internal MNR reviewers during plan review and approval, and ultimately to the public, so that they can understand why larger cuts are proposed and/or authorized. Where they represent 20-39% of the planned harvest area in a particular FMU, the Regional Director may seek a second opinion from a senior biologist as to the appropriateness of the prescription. If the percentage is 40% or more, the timber management plan must be reviewed and approved by the Assistant Deputy Minister before operations may proceed.

(Ex. 2251B)

MNR told us that the Moose Guidelines were intended to give "general guidance" to moose habitat managers and were never intended to be "numerical limits" on clearcut size. The evidence we received from parties at the hearing and the submissions from the public lead us to conclude that the Moose Guidelines have widespread support as a means of regulating clearcut size. We reject MNR's position that the Moose Guidelines cannot be used as something other than a narrowly defined management tool. We find that the influence of the Moose Guidelines on promoting careful planning of clearcut sizes benefits other forest users and should be recognized as a necessary and beneficial approach in timber management planning of harvest operations.

FFT's Evidence

FFT witness Crandall Benson prepared 57 maps derived from LANDSAT satellite data to identify clearcut areas (Ex. 1621 and Ex. 1622) in support of his argument that MNR's past practices resulted in unacceptably large clearcuts. We did not find this evidence convincing because Mr. Benson admitted to mistakes in interpreting the satellite information and included areas that had been cut 40 to 50 years ago as part of a large contiguous clearcut.

It was from Mr. Benson's evidence on clearcuts in the Gordon Cosens FMA near Kapuskasing that the public received media reports of clearcuts in our forest half the size of Prince Edward Island. Tim Gray, director of the Wildlands League, a member of FFT, entered into this debate with his submission that dozens of clearcuts of greater than 260 hectares were being planned by MNR in the same locations, including one of 3,460 hectares (Ex. 1963). We reviewed the evidence carefully and conclude that only one clearcut of 3,460 was planned because of extensive budworm damage and note that there are about 60 others larger than 260 hectares. Jacques Cantin, a company forester who appeared at the New Liskeard community hearing, told us more about harvesting in these budworm-infested stands and explained why it was not considered worthwhile in this salvage cut to leave uncut corridors or blocks to break up the cut (trans: vol. 335, pp. 58888-92). To satisfy ourselves of the true facts of the situation, we conducted a site visit and flyover of the Gordon Cosens/Kap area in October-November 1991. We saw large areas that had been logged many years before and how regenerating cutovers and large amounts of standing timber can be clearly seen. In our opinion, this in no way constitutes a clearcut half the size of Prince Edward Island and describing it that way has only served to misinform an already nervous public.

Information on Clearcut Size in 1987-1988

MNR and the parties formed a working committee to design a clearcut exercise that would provide answers to FFT's interrogatory concerning the maximum size (in one cut and contiguously) of clearcuts carried out in our forest in 1987/88. This work was a costly data gathering and mapping project that took many months to complete. The results were presented by MNR Panel 10B (Ex. 1008). The parties disagreed on how the data should be interpreted because they all had their own definitions on the maximum size of a single clearcut.

MNR said that the largest single clearcut in Ontario in 1987/1988 was an open clearcut of approximately 1350 hectares on the English River Forest in Ignace District, as identified in

the clearcut exercise (MNR Panel 10B, Ex. 1008, p. 68). The clearcut exercise did not reveal whether there is a trend to larger or smaller clearcut areas.

Clearcut Sizes in the 1991 Plans

MNR also said that the largest single clearcut planned in a 1991-1996 Timber Management Plan is 3,460 hectares in the Gordon Cosens FMA in Kapuskasing District (Ex. 2270). As we discuss above (p. 166), salvage of insect-infested timber was the reason for this very large clearcut.

Mr. McNicol testified that MNR used different criteria to determine clearcut sizes than was used in the clearcut exercise, partly because of time constraints, and partly to avoid seeming to skew the results towards smaller clearcuts (trans: vol. 388, p. 66961). FFT submits that MNR did underestimate the clearcut sizes, arguing that if the criteria of the clearcut exercise had been used, some of the cuts would have been tabulated as one larger cut. Because of this problem with different criteria we have avoided trying to compare the evidence of the clearcut exercise with the results of the analysis in MNR's Reply.

We do, however, have evidence that clearcuts are getting smaller. The analysis of the 17 Timber Management Plans presented by MNR Reply Panel 2 and in Ex. 2270, reveals that application of the Moose Habitat Guidelines has resulted in much smaller clearcuts in areas of high and moderate moose capability.

For all 17 Plans:

- 60% of cuts are 1 hectare to 130 hectares
- 26% of cuts are 131 hectares to 259 hectares
- 14% of cuts are 260 hectares or larger

Most of the large cuts, however, are concentrated in the Gordon Cosens FMA, which is not considered prime moose habitat. As discussed above, extensive insect damage was cited as the reason for approving this concentration of large clearcuts. When Gordon Cosens is removed, the remaining 16 forest management units planned the following cut sizes:

- 69% of cuts are 1 hectare to 130 hectares
- 26.5% of cuts are 131 hectares to 259 hectares

- 4.5% of cuts are 260 hectares or larger

MNR undertook a comparison of the size of clearcuts in the 1985-90 and 1990-95 Plans for Havrot Township, part of the Peshu Lake Crown Management Unit, using the same criteria as the clearcut exercise (Ex. 1640). Between 1985-1990, most of the harvest occurred in five large open clearcuts, which ranged in size from 119 hectares to 640 hectares. The 1990-1995 allocation consists of eight smaller clearcuts, ranging in size from 53 to 176 hectares. MNR stated that had the Moose Habitat Guidelines been in place prior to the approval of the 1985-1990 Peshu Lake Timber Management Plan, the allocation and resultant cutting pattern might very well have been more like the 1990-1995 Plan allocation, where the guidelines were rigorously applied (Ex. 1640A, p. 4).

We conclude from these data that smaller clearcut sizes are being planned compared to past practices. The reasons for this can be explained by application of the Moose Guidelines but we also believe that MNR is responding to public demands that very large clearcuts be the exception rather than the rule.

What Other Jurisdictions Are Doing About Clearcuts

FFT tried to convince us that Ontario lags behind other jurisdictions in establishing limits to clearcut size. Crandall Benson asserted that other Canadian provinces control clearcut sizes, as does the United States Forest Service, with attention to the size of individual cuts, size of areas of standing timber between contiguous cuts, and the height of surrounding timber required to enable return cuts (Ex. 1604(a), pp. 111-12).

We asked MNR to explain why Ontario does not have limits to clearcut size similar to those found in Sweden, Finland, New Brunswick, Nova Scotia, Quebec, Manitoba, Saskatchewan and British Columbia (Board Interrogatory 24). MNR gave the following reasons: most of the guidelines apply only to areas "cut clear;" to some degree, the numbers are arbitrary; some of the documents discuss the tree species to which the guides apply, while others do not; the documents do not deal with factors other than size, or the relationship between these other factors and size; the documents are simplistic and do not provide the depth of information available in MNR's Silvicultural Guides and Implementation Manuals; and the information provided to the Board does not explain how the guidelines are to be used in planning, such as how decisions to exceed numerical limits are reviewed or documented.

We heard conflicting information about whether the U.S. Forest Service, which appears to us to be experiencing the same sort of turbulent change as MNR, is moving away from

numerical limits on clearcut size. The evidence we received suggested that clearcut limits in U.S. National Forests – ranging from 16 hectares to 40 hectares, with exceptions for larger clearcuts to provide specific wildlife habitat – are considerably smaller than Ontario's 260-hectare limits provided under the Moose Guidelines (Ex. 416A, p. 354).

The reason the U.S. Forest Service is rethinking its small clearcut size limits is the same reason that MNR argues against adopting FFT's 100-hectare clearcut restriction. Scientists are becoming concerned that confining clearcuts to small patches will "fragment" the forest, and reduce biodiversity and ecological integrity. The evidence of Chris Maser and Zane Smith brought into focus for us the dilemma for forest managers today: both very large clearcuts and "checkerboard" patterns of small clearcuts may cause problems (trans: vol. 283, pp. 50606-8 and Ex. 1749C, pp. 46-48). Scientists have not yet found an answer and the concerns are so recent that they were not brought to our attention until the second year of the hearing (trans: vol. 130, p. 21971). FFT proposes landscape management as a solution but we discuss in Chapter 11 why this concept is in such an early stage of development that MNR must be required to research it before any moves to implementation can be planned.

The evidence on how other jurisdictions, especially the United States, are wrestling with clearcut size issues reinforces our opinion that MNR must proceed cautiously in the direction of permitting a range of clearcut sizes with very large ones treated as exceptions.

What the Public Told Us

MNR told us to ignore the public's opposition to large clearcuts. It said the opposition was uneducated and emotional and motivated by social and political pressure. MNR said our job was to explain to the public the necessity for large clearcuts (trans: vol. 410, pp. 69994-95). We disagree. One of our reasons for approving this application is that public ownership of our forests gives the public a particular interest in determining the broad direction of forest management. Our consideration of the public interest in timber management planning is one of our responsibilities under the *Environmental Assessment Act*. Nowhere in our approval do we diminish MNR's authority or responsibility to conduct timber management on the basis of sound scientific and management principles. We do give formal recognition to the public's participation in decision making. In this respect we have listened carefully at the hearing to what the public considers acceptable clearcut practices.

Comments about large clearcuts by people who appeared at the satellite hearings can be divided into three categories. We saw a distinct north-south Ontario difference in attitude

towards large clearcuts, with an extremely hostile reaction by some northerners to what they perceived as southerners' interference in an issue that they believe should be decided in the north. Among the northern participants, we observed a noticeable split between those people who were in some way involved with timber management and those who were primarily concerned with non-timber use of the forests.

Of those who supported MNR, such as the mayors of mill towns including Dryden and Espanola, contractors involved in logging or tree planting, and seedling producers, many recognized that clearcutting was unsightly, but said it was necessary to reproduce the forests. Many supported the application of the moose guidelines or some form of reduced cut sizes. A significant number supported MNR's proposals or a slight variation. Many of these people stressed that they lived, worked and played in the forest and favoured multiple use of the forests.

There were also many participants in the northern satellite hearings who opposed clearcutting. These included: many Aboriginal people, tourist operators (both fly-in and road access), trappers, cottagers, anglers and hunters. They strongly believe that large clearcuts have resulted in the destruction of wildlife, wildlife habitat, spawning beds, water quality, portages and businesses. Despite the concerns expressed, we note that many support multiple use, but clearly feel that clearcut size has to be reduced. We believe that northerners recognize the need for and the benefits of timber management.

The Board heard a far different position at the satellite hearings outside of northern Ontario, and particularly in the southern urban areas. While most of the concerns regarding clearcut size expressed in the north were repeated, the solutions or remedies proposed were much more severe than those being sought in the north. Recommendations ranged from absolutely no clearcuts to very strict limitations on clearcut size, such as a maximum clearcut size of 12 hectares suggested by the Western Wilderness Committee. Such small cuts would make it impossible to preserve the current ecosystem pattern of large even-age stands in the boreal forest and, we were told, would also be costly to industry. It is not surprising that participants at the satellite hearings in Ottawa and Toronto displayed less understanding of the origins of the boreal forest and the silvicultural activities associated with this forest type. Educating the public about forestry is MNR's job and we discuss this on p. 408.

Here are some excerpts of testimony of some individuals at community hearings showing some views we found to be representative of public comments on large clearcuts:

Charlie Smith, farmer and part-time guide, at Espanola:

If we must clearcut, and I don't think we must, it should be done in smaller strips than it is now. If you have to go back in 10 or 20 years and take another strip beside the old one, so be it. ... Certainly no more than a third of the land surface of a given area should be cut in a 10-year period and no single cut should be larger than 20 hectares.

(trans: vol. 232, p. 42247)

Larry Reeve, Timmins Fur Council, at Timmins:

Four city blocks would be a reasonable clearcut, and then a buffer zone and then possibly another one, either a block cut or a strip cut, but some buffer zone for the animals to survive while the replanted forest comes up.

(trans: vol. 234, p. 42661)

Thomas Clouthier, on behalf of the Ottawa Valley Forest Industry Alliance, at Ottawa:

Clearcutting seems to be a major problem. ... The problem is one of perception. Shortly after an area has been clearcut and site prepared it does look like a war zone, but after it has been properly replanted and the area has been given a few years until the trees are growing to a height that can be seen, people realize that we are following the only viable course of responsible sustainable management.

(trans: vol. 334, pp. 58683-84)

Chris Poate, of the Kenora District Chamber of Commerce, said in Kenora that he once "didn't like to see clearcuts" but as he learned more about the Ontario boreal forest:

I began to get an attitude and a realization that the harvesting techniques used here in clearcutting were a close mimic of the natural process of forest fires.

(trans: vol. 311, p. 55004)

Ian Huggett, conservation group Ecowatch, at Ottawa:

Clearcut sizes are too large, 200 to 20,000 hectares. Now the associated problems. Creates a harsh micro-climate and wide fluctuations in temperature and moisture conditions, soil loss and compaction, retard seedling regeneration, soil loss and loss of critical winter range for ungulates.

(trans: vol. 334, pp. 58654-55)

Patrick Moore, who spoke at the Toronto community hearing, was asked how large clearcuts should be:

I would say less than a hectare. I don't see that we should be clearing vast tracts of land.

(trans: vol. 331, p. 58241)

Public opposition to large clearcuts was loud and clear, and must be given due weight in establishing public policy on this issue. We have done so in our condition setting a range up to 260 hectares for clearcuts, with room for exceptions. But we were concerned that much of the sentiment was based on a misunderstanding of the history and current conditions in Ontario's forests. Therefore, as discussed on p. 408 in Chapter 11, we are ordering MNR with the involvement of the parties to this hearing to develop an educational program on clearcuts, giving a fair presentation of all sides of this issue so that people can reach their own well-informed conclusions.

Findings

The scientific evidence on clearcuts supports the view that there should be a range of clearcut sizes in our forest. Regenerating the boreal to large, even-age conifer stands requires some large clearcuts but uncertainty about the environmental effects such as maintenance of biodiversity suggests the size of clearcuts should vary across the landscape.

MNR submits that the appropriate range of clearcut sizes in a given area should roughly approximate the natural forest conditions based on disturbance patterns, along with consideration of various management objectives for such things as wildlife habitat (Board Interrogatory 20).

In Reply evidence, MNR introduced its intention to develop new Environmental Guidelines that would give direction on:

- (a) normal ranges of clearcut block sizes by "ecoregion," based on how natural patch size and distribution derived from information such as silvicultural characteristics, forest stand distribution and regional fire history patterns;
- (b) allowed and required ranges (such as percentage by size class);
- (c) reporting of procedures and reasons for exceptions.

The development of this direction would require consideration of the need for operational definitions for terms such as "clearcut" and "contiguous cut"; mapping procedures for clearcuts; and routine reporting requirements. The preparation of this direction would require consultation with various experts and interested persons.

MNR committed itself to begin producing this implementation manual, "to address operational considerations for the activities of harvest, renewal and maintenance with the specific purpose of addressing protection of the physical environment, and to provide direction in relation to harvest layout and configuration," upon conclusion of the hearing, and has targeted 14-16 months for its production (trans: vol. 387, p. 66678).

We agree with the direction MNR is taking in improving the design of clearcuts to be more appropriate in configuration and size and we approve the development of the new Environmental Guidelines in Condition 94(b). MNR said it would involve "a wide range of experts" as well as representatives of "the general public" in preparing these guidelines (trans: vol. 387, pp. 66678-79). MNR counsel said that the ministry "recognizes there's a need for the range of clearcut sizes to be different" (trans: vol. 410, p. 70006).

In weighing all of the evidence, we have decided to order in Condition 27 that clearcuts normally be planned in a range of sizes up to 260 hectares. The range of up to 260 hectares provided in the Moose Guidelines has been demonstrated to our satisfaction to give sufficient flexibility to MNR and the forest industry in achieving their timber supply objectives. We believe that the 260-hectare limit addresses the public's concerns about large clearcuts. We also believe that this restriction is the best approach to protecting the forest environment given the scientific uncertainty about the impacts of both small and large clearcut sizes.

We accept that some large clearcuts are required and we rely on the judgement of foresters to make exceptions above the 260-hectare limit for biological and silvicultural reasons such as salvage operations, overmature stands and wildlife habitat requirements. The rationale for exceeding 260 hectares must be reported in the Plan. It is also important that 260 hectares not become the standard size clearcut, resulting in only a few clearcuts being larger or smaller. The evidence is clear to us in supporting a range of various sizes.

- 27. MNR shall implement a restriction on clearcut harvesting requiring a range of sizes of clearcuts not to exceed 260 hectares. MNR shall also develop standards for configuration and contiguity of clearcuts which will ensure that the purpose of this restriction is not frustrated.**

- (a) These restrictions and standards shall be incorporated into the Environmental Guidelines for Timber Management Activities specified in Condition 78(b).
- (b) Silvicultural Ground Rules shall be prepared with the objective of ensuring that clearcuts are planned to a range of sizes and not consistently approach or meet the permitted maximum. Where for sound biological or silvicultural reasons individual or contiguous clearcuts exceed 260 hectares, they shall be recorded in the Plan as an exception to this condition, with reasons provided.
- (c) MNR shall inventory and monitor clearcuts and exceptions to the maximum size restriction as well as configuration and contiguity. The results shall be in the Annual Report for the Forest Management Unit, in the Annual Report to the Legislature, in the five-year State of the Forest report and in the review for the Minister of Environment and Energy pursuant to Condition 114(a)(v).

We are also requiring MNR to report annually on the average and maximum size of clearcuts (Appendices 18 and 20) and to report its progress on implementing Condition 27 in Appendix 20, section 1(p). At the end of the approval period, there will be considerable evidence on such matters as landscape management, biodiversity conservation, data on long-term monitoring studies of the Moose, Fish Habitat and Tourism Guidelines and many other issues relevant to timber management and integrated forestry objectives. The Minister of Environment and Energy will then be in a better position than we are today to decide if clearcut restrictions should be continued.

POTENTIAL ENVIRONMENTAL EFFECTS

Forest Floor

The Coalition and FFT submitted that certain harvest techniques and heavy logging equipment could cause damage, such as compaction, rutting and erosion that would hinder forest regeneration for years to come.

We have no evidence of wide-scale problems with compaction and rutting in the Area of the Undertaking. Coalition witness Dr. William Carr described problems of soil compaction and erosion in British Columbia (trans: vol. 343, pp. 59883-85). We agree with Mr. Armson, however that the soils, climate and topography of our boreal forest are not directly comparable to the interior plateau of British Columbia (trans: vol. 392, p. 67547).

We accept the evidence of experienced MNR foresters Ken Armson, John Cary, Dave Gordon and Rich Greenwood and of OFIA witnesses Rod Gemmell and Bill Roll who testified that the threat of serious, permanent site damage was greatest in the clay belt when

narrow-tired skidders operated in wet conditions. Since these potential effects have already been reduced or eliminated by the advent of high flotation low-pressure wide tires in the early 1980s and by limiting harvest to winter months in sensitive areas, MNR concludes that there is limited potential for significant compaction and rutting in Ontario's forest. In those areas where the potential is high, measures will be taken to prevent or minimize these problems (trans: vol. 387, p. 66683). MNR told us that the new environmental guidelines for timber management activities will give guidance to field staff on site degradation.

On the potential for erosion, MNR's witnesses said "mass erosion" is not a threat in Ontario because logging does not take place on slopes greater than 60 percent. Erosion resulting from wind or surface run-off is rare because harvesting leaves most of the ground cover undisturbed (Response to Board Interrogatory 74). Soil erosion is a potential problem on slopes leading down to lakes and streams but there was persuasive evidence that the Code of Practice for Timber Management Operations in Riparian Areas should prevent these unacceptable effects.

Water and Fish

The Board heard evidence that logging could cause changes in water quality, including higher temperatures, changes in the water table and increases in nutrients such as phosphorous. FFT described how harvest could alter different elements of an equation representing the hydrologic cycle (Ex. 1604A, p. 117) and its witness, George Marek, gave his views about how changes in the water table following harvest can impede regeneration of black spruce. We are persuaded by the evidence of MNR that these effects are unlikely to be significant or long lasting (trans: vol. 72, p. 12310).

The potential effects of sedimentation from erosion were identified as the most serious concern with road access (see p. 126, Chapter 4) and also raised as a concern about logging. MNR witnesses told us the Code of Practice for Timber Management Operations in Riparian Areas is used to prevent or minimize effects of logging from erosion, sedimentation and organic debris (trans: vol. 80, p. 13486). This is accomplished through such "good practices" as following slope contours when skidding, avoiding repeated use of the same skid trails so that soils do not become compacted, providing a trail for run-off and not operating on some sites in wet conditions (Ex. 2276, Ex. 2277).

Dr. John Allin, a fisheries biologist with MNR, told us the potential for harmful effects to water are greatest in those areas where logging exposes highly erodible soils on steep slopes (trans: vol. 102, p. 17139). In Dr. Allin's opinion, the Fish Habitat Guidelines (Ex. 304) and

their provision of reserves near water bodies protect the aquatic environment against significant effects from logging (trans: vol. 80, pp. 13381-82). Witnesses from MOEE and the forest industry also supported reliance on the Fish Habitat Guidelines.

We carefully considered the evidence on whether clearcutting should be allowed to the shoreline of water bodies. Until 1985, MNR followed the practice of putting 400-foot reserves around all water bodies but determined that more timber was being lost to industry by these "doughnut" reserves than was necessary to protect the water and we discuss this on p. 182. MNR now relies primarily on the Fish Habitat Guidelines and the Code of Practice for Riparian Areas to decide if clearcutting to shorelines should be permitted for each water body.

The Fish Habitat Guidelines prohibit clearcutting adjacent to lakes supporting lake trout, self-sustaining brook trout or aurora trout. These cold water species are considered to be more sensitive to the potential adverse effects of timber management than warm water species. During the hearing, MNR agreed to the Coalition's proposal that muskellunge waters be given protection equal to these trout species and said the Fish Habitat Guidelines would be amended to do this. Clearcutting to shorelines is also restricted in some cases to protect non-timber values such as aesthetics.

The Fish Habitat Guidelines do not apply to lakes smaller than 10 hectares in size with the exception of headwater lakes and lakes which possess or may possess significant fisheries values. But MNR witnesses testified that lakes smaller than 10 hectares are not expected in most cases to support significant fish habitat, and most of lakes in the Area of the Undertaking are smaller than 10 hectares. This concerns the Coalition, which argued that these small waterbodies may have significant fisheries resources, particularly for the baitfish industry. We accept MNR's approach which puts the responsibility for protecting fish values in lakes smaller than 10 hectares in the hands of biologists who are familiar with these water bodies and know how to protect them. A related issue involves wildlife that may frequent these small lakes and benefit from sheltering vegetation near the shore. These aquatic feeding areas, however, are included in the values list (App. 5, part B, section (1)(a)(ii) and should therefore be protected in the Area of Concern process.

Clearcutting is permitted in Areas of Concern adjacent to cool water and warm-water streams, to lakes not supporting trout species or muskellunge, to streams not appearing as permanent streams on a topographic map of scale 1:50,000 and to intermittent streams which do not provide fish spawning habitat. Even where permitted in these instances, clearcutting is restricted adjacent to critical fish habitats such as spawning areas or upstream of such habitats as far as the first permanent water basin or bog (because this can act as

traps for sediments, debris and nutrient). No more than 50% of the shoreline of lakes and the length of streams can be clearcut and usually only in non-contiguous blocks or strips. We were told that MNR staff will only permit clearcutting to shorelines where it is demonstrated that fish habitat will be protected (trans: vol. 80, pp. 13464-67; Ex. 416B, p. 867) and that harmful effects such as erosion will be avoided.

FFT proposed a condition on protecting watercourses from equipment used in timber operation but we are satisfied that such protection is already adequately provided for in the Code of Practice for Timber Management Operations in Riparian Areas (Ex. 2276).

The Coalition brought to our attention the issue of cumulative watershed effects (including effects on downstream conditions from upstream timber operations). Mr. Dennis Krochak, a witness for the Coalition, testified on research done in New Hampshire, British Columbia, Washington state and Oregon (trans: vol. 348, pp. 60703-25). The Coalition proposed that this work be used by MNR to develop predictive modelling for cumulative watershed effects in Ontario. MNR responded that the studies discussed by Mr. Krochak were done in mountainous areas and were not applicable to the Area of the Undertaking. Dr. Schiefer, a witness for OFIA, and MNR witnesses testified that timber harvesting has not been shown to have a measurable negative effect on fish in Ontario and that there is no evidence of a substantial problem with long-term cumulative negative impacts (trans: vol. 217, p. 39302).

MNR is proposing to consider the potential for cumulative watershed effects in its long-term monitoring studies on the effectiveness of the Fish Habitat Guidelines in protecting the aquatic environment and we discuss this research in Chapter 8 on p. 306. We are satisfied by the evidence of Dr. Robert Steedman, the MNR scientist responsible for experimental watershed studies being planned in the Atikokan district, that these studies will address some potential cumulative downstream effects of harvest, renewal and tending such as nutrients, sediments, temperature and habitat structure (trans: vol. 387, p. 66761).

Wildlife

It is MNR's position that wildlife species in our boreal and Great Lakes-St. Lawrence forest are equipped to survive logging because they have adapted to periodic natural disturbances (Ex. 416B, p. 528). Harvesting can have direct impacts on wildlife, such as destroying the habitat that animals occupy, and indirect impacts, such as hunting and fishing pressure that follows roads built to harvest timber. Harvesting benefits some species such as moose and deer which prefer forest clearings and edge but harvesting may adversely affect other species, such as the pine marten or pileated woodpecker, whose habitat requirements are

old-growth forest or particular features such as snags (dead or dying trees). Dr. David Euler, a wildlife biologist and MNR's habitat development coordinator, told us that MNR is committed "to maintaining all species of wildlife at levels necessary to sustain viable populations and meet wildlife objectives" (Ex. 416B, p. 520). MNR uses timber management planning as its chief means of manipulating wildlife habitat. MNR's wildlife managers practise a "featured species approach" aiming to provide habitat suitable for chosen species. This would include threatened or endangered species, moose in the boreal forest and deer in the Great Lakes-St. Lawrence forest. Other species may be locally featured. MNR says it is moving towards adding new approaches while retaining some aspects of featured species. FFT proposed that MNR move into what is called "landscape management" while the Coalition urged the use of habitat supply analysis and additions to provincially featured species. We discuss these proposals and our findings in Chapter 11, p. 389, where we accept the Coalition's proposal to add the pine marten and pileated woodpecker as provincially featured species.

Dr. Euler testified that giving protection to threatened and endangered species is the first consideration. In addition to species identified in the *Endangered Species Act*, MNR maintains a listing of wildlife species (including fish, invertebrates and vascular plants) designating those which are rare, threatened or endangered, extirpated and extinct in Ontario (Appendix 11 of Ex. 266A). MNR also works with the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to develop a national list of species regarded by the best scientific evidence available as being at risk in Canada (Ex. 1713A).

It is MNR's position that there are relatively few rare, threatened and endangered species in the Area of the Undertaking and only some of these are at risk from harvest and other timber operations. MNR analyzed the potential effects of timber operations on the 17 rare, 10 threatened and nine endangered species identified in the Area of the Undertaking (Update to Ex. 266A, MNR Question 22). The results for this analysis indicate the possibility of negative impacts for six species listed as rare – West Virginia white butterfly, Cooper's hawk, red-shouldered hawk, great grey owl, southern flying squirrel and wood turtle; for one species listed as threatened – ginseng; and for four species listed as endangered – bald eagle, golden eagle, peregrine falcon and small white lady's slipper orchid (Response to Board Interrogatory 11). MNR said the potential impact for eastern cougar is unknown (Ex. 266A, p. 356, and Ex. 320). In his evidence, Dr. Euler cited the example of bald eagles and how their habitat is protected during timber harvest (Ex. 348).

MNR argued that threatened or endangered species are protected during timber management planning in three ways:

- (1) the *Endangered Species Act*,
- (2) direction found in resource/environmental manuals for Cooper's hawk (Ex. 237), red shouldered hawk (Ex. 2252, p. 29), bald eagle (Ex. 348), golden eagle (Ex. 347) and the peregrine falcon (Ex. 346), and
- (3) the Area of Concern planning process, which calls on expert advice to protect species encountered during the preparation of the Plan and considered to be at some risk from timber management.

The second concern is usually the potential effects on moose and deer habitat. MNR relies on its provision of habitat for moose and deer as provincially featured species to provide the same habitat protection for approximately 70% of other species. Moose and deer habitat needs (browse, aquatic feeding areas, clearings, calving sites and denser forest) are assumed also to benefit many other wildlife species.

Is MNR being successful in providing habitat through timber management planning for moose and deer? The evidence shows that the population of moose, which live primarily in the boreal forest and are exposed to clearcutting, has increased from an estimated size of 75,000 at what was considered a low point in 1978 to 94,100 in 1991 (Ex. 2148). There is debate about whether the growth of the moose herd can be attributed to the provision of habitat under the 1988 Timber Management Guidelines for Moose, one important aspect of which is limits on clearcut size, or stricter controls on hunting (Ex. 2295). Deer are primarily found in the Great Lakes-St. Lawrence forest and their numbers increased from 100,000 in the early 1980s to 250,000 by 1988 (trans: vol. 84, p. 14124). MNR intends to test the effectiveness of the Moose Guidelines through long term scientific studies (Condition 80) described on p. 306. Effects on other species which benefit from application of the Moose and Deer Guidelines will be measured in a provincial wildlife population monitoring program (Condition 81(a)) discussed on p. 309.

John McNichol brought to our attention the habitat requirements of caribou, which are different from those of moose or deer. Woodland caribou require very large stands of undisturbed conifer on the order of several thousand hectares. The effects of one large clearcut would be less severe on caribou than the effects of many small clearcuts adding up to the same total area, a pattern that would be favoured under the Moose Guidelines (Ex. 247).

In addition to provincially featured moose and deer, MNR provides protection for locally featured species and we received evidence about how this has been done for pine marten and red-shouldered hawk (Ex. 416B, p. 524). In his testimony, Dr. Euler said the best

evidence available was that no species dependent on older forest was in decline as a result of timber operations, with the possible exception of the red-shouldered hawk. He said there was "plenty of time to make adequate arrangements if it looks as though a problem is occurring" (trans: vol. 97, p. 16249) and explained what MNR does to inventory red-shouldered hawks and put buffer zones around their nests.

Dr. Euler identified protection for species that nest in snags (dead or dying standing trees) as a concern he has "about the future and that we not let it become a problem ten years from now" (trans: vol. 91, p. 15274). We reviewed MNR's evidence that population levels of species dependent on snags do not appear to have been reduced at the provincial level (Ex. 416B, p. 543; MOEE Interrogatory 14 in Ex. 479). There is no shortage of snags in the boreal forest because of a preponderance of older age classes and a history of fire disturbances (trans: vol. 83, p. 13846), so retention of snags is primarily of concern in the Great Lakes-St. Lawrence forest and MNR relies on the use of the Habitat Management Guidelines for Cavity Nesting Birds in Ontario (Ex. 244) to provide guidance where retention of snags for wildlife habitat is a local concern for timber management planning. MNR is also proposing to monitor species which use snags and dead and downed woody material (Condition 81(b)) and whether there is a need to actively supply this type of habitat in timber management planning (Condition 80). We reviewed the evidence of Mike Buss, an MNR expert in integrated resources, habitat and fish management, on how MNR's former eastern region requires a certain number of snags per hectare because of a concern for cavity-nesting species in that area (Ex. 603D, p. 375). This approach is similar to that proposed by FFT as a requirement for all eligible harvest areas and we are satisfied that MNR is alert to potential problems. We also believe the addition of the pileated woodpecker as a provincially featured species addresses this concern.

Findings

Dr. Euler, whom we found to be a particularly credible and authoritative witness, said there was no evidence that any species whose habitat needs might be sensitive to the impacts of timber operations was "in trouble" except the red-shouldered hawk (trans: vol. 83, pp. 13926-27, and Answer to MOEE Interrogatory 14 in Ex. 479). FFT argues that MNR has not conducted any scientific studies to support this claim. We have reviewed MNR's evidence on the ESSA exercise, in which groups of experts were brought together for the purpose of providing the best available scientific information about the impacts of timber management on wildlife habitat among other non-timber resources (Ex. 2274). We also considered evidence presented in MNR's Witness Panels 10 to 14 on the environmental effects related to access, harvest, renewal, maintenance and protection and the expert testimony of MNR

witnesses who have practical experience in timber management and wildlife protection. We find that MNR has submitted persuasive evidence to support its position that harvesting can be carried out in a way that prevents, minimizes and mitigates adverse effects on wildlife.

Both the OFAH-NOTOA Coalition and FFT put forward their own conditions for protecting endangered and threatened species. The Coalition's proposals, Conditions 31 and 32 of its Schedule B, would require MNR and all its district offices to maintain extensive documentation, frequently revised, on such species and their habitat needs. FFT's Condition 55 would institute new definitions for "endangered," "threatened," and "vulnerable" and require MNR to set up new monitoring and data-collection programs for these and other species of special ecological or socio-economic importance, including a new "species vulnerability index" to be used by MNR managers. The evidence did not persuade us that any of these proposals, despite all the extra fieldwork and paperwork involved, would benefit the species involved. Instead we were persuaded that, with the addition of two new featured species dependent on older successional forests for habitat as described in Chapter 11 (p. 389), MNR's practices are a sound approach to protecting species at risk from timber management.

Reserves

The public wants larger reserves in which logging will be prohibited or modified, but the industry argued that reserves can remove too much timber supply. No-cut reserves and modified areas of operation are decided in the Plan through the application of Implementation Manuals and the direction these give to the foresters in designing prescriptions and silvicultural ground rules. According to MNR, about 4 to 5% of the areas selected for operation are modified areas and about 9 to 10% are no-harvest reserves (Response to Board Interrogatory 147).

The Cost to Industry

OFIA commissioned a case study looking at the experience of Abitibi Price's operations on the Spruce River FMA to answer these questions:

- (1) How much timber would be available if there were no reserves or modified areas at all?
- (2) How much timber was not available to industry because of reserves protecting non-timber values under MNR's current practice?

- (3) How much more timber would be removed if the Moose, Fish and Tourism Guidelines were rigidly applied as rules rather than guidelines or "pushed to the maximum" (trans: vol. 184, pp. 32364-67)?

Cam Watson, an economist and the study's author, concluded that current guideline practices reduce the potential timber supply by about 12%, an estimate comparable to that of MNR's. If the guidelines were applied inflexibly, according to this case study, reserves would remove an additional 11% of the remaining wood supply.

The OFIA case study (Ex. 1047) also identified various costs to the forest industry associated with reserves. Michael Ross, a consultant for Peat, Marwick, concluded that the case study results suggest that existing reserve policies have increased wood costs by approximately 67 cents per cubic metre or 1.5% of typical wood costs in northern Ontario. Mr. Ross estimated that a move to a more stringent or inflexible reserve scenario could add another \$1 per cubic metre to wood costs in the future or an annual incremental cost to the forest industry as a whole on the order of \$20 million.

We note that OFIA's 11% estimated loss under stringent guideline application is deliberately high, as the analysis admits. The Fish Guidelines, for example, would never really be applied as though all lakes were cold water and all slopes steep. We are persuaded, however, that reserves and modified areas will grow in size because future Plans will be applying new guidelines such as the Cultural Heritage Guidelines finalized in 1991, and because we are ordering MNR to develop policies for old growth, wilderness areas, wildlife protection and landscape and biodiversity management. The implications of this future work for wood supply are a shrinking timber land base and increased costs. The price of protecting non-timber values is high and some portion could be charged to the forest industry by way of increased wood costs. MNR's responsibility for providing timber to the industry will become more challenging.

Fixed vs. Variable Size Reserves

MNR formerly followed a practice called the "doughnut" approach of putting a no-cut 400-foot (122-metre) reserve around all shorelines to accommodate other resources such as fisheries, wildlife habitat and scenic values (trans: vol. 5, pp. 718-21). In 1985 this policy was replaced with variable width reserves to be determined by analysis of site-specific problems and remedies (Ex. 6, p. 242). MNR came to see doughnut reserves as a rule-book approach that prevented harvesting valuable timber lost in situations, for example, where scenic values could be protected with a smaller reserve. In other cases, reserves larger than 400 feet were required to protect the non-timber resources. Some critics, however, saw the change as a

grab for wood by the industry (trans: vol. 5, p. 726). The submissions we received from non-timber users show a preference for a return to a standard reserve size. Tourist operators proposed fixed reserves around remote tourism lakes ranging from several kilometres down to several hundred metres. For example, remote tourist operator George Theriault appeared before us at the Timmins community hearing and proposed reserves of up to five miles for what he called "critical" lakes, up to one mile for all rivers and up to 2,000 feet for all creeks. His reasoning was that, although the five-mile estimate was only a guess, he has seen all-terrain vehicles gaining access to a lake from as far away as three miles and he believes this demonstrates that anything smaller is "totally inadequate" (trans: vol. 234, pp. 42630, 42636). We discuss the concerns of tourist operators in Chapter 9.

Mark Robinson, a witness for FFT and a member of Canoe Ontario, proposed a 200-metre reserve along the shoreline of the Mississagi waterway provincial park in the Blind River district to protect its value as a remote scenic canoe route. He based his proposal on his understanding that the provincial park's planning and management policies or the "blue book" as he called it, provides for reserves of 200 metres to 2,000 metres (trans: vol. 249, p. 44874). He had also observed on the Wenebagon River, a designated canoe route, that a clearcut and access road were within "30 paces" of the river. He observed and photographed clearcuts intruding into the 120-metre Mississagi waterway park reserve at several locations in Shulman Township (Ex. 1433A). MNR proposed a minimum 150-metre shoreline reserve but Mr. Robinson found this compromise unacceptable. He argued that MNR and the forest industry should observe a larger reserve unless they could demonstrate that logging could be done closer to the shoreline without disturbing the non-timber values.

MNR has no standard reserve size for protecting canoe routes. The routes can be identified as values in the timber management planning process and dealt with as Areas of Concern. MNR says protection will be determined on a site-specific basis depending on topography and vegetation, on application of the Fish Habitat Guidelines to protect fisheries and water quality and on the Tourism Guidelines to protect the aesthetics associated with canoe routes.

We do not believe that reinstituting fixed-width reserves is a better means of protecting non-timber resources. FFT witness Chris Maser argued against standard size reserves and we agree with his view that some areas require more protection than others (trans: vol. 283, pp. 50635). We are also persuaded that the guidance on reserve widths in MNR's implementation manuals, particularly the fish and moose guidelines, reflect today's scientific knowledge. The Provincial Technical Committee we are ordering in Condition 89 will regularly review the implementation manuals and change them as better information becomes available. The multi-year effectiveness monitoring studies on the Moose, Fish and

Tourism Guidelines we are ordering in Conditions 80 and 81 (see Chapter 8) will also show if the variable reserve approach is working successfully. We agree with MNR's argument that the ability of resource managers to develop specific prescriptions for a particular forest condition has been demonstrated at the hearing. The process we are approving depends on the experience of MNR's foresters, biologists and other experts to use their judgement and not be hemmed in by rules that do not respond to change.

Visual Resources

We are not convinced, however, that MNR's approach to variable width reserves is satisfying the aesthetic concerns of the tourism industry and recreational users such as canoeists, hikers and cottagers. We conclude that MNR must do a better job of protecting aesthetic values. We discuss this issue and our Condition 24 in Chapter 11, p. 406.

Marking and Trespass of Reserves

The public complained of timber operations trespassing reserves and OPSEU witness Brian Maloney identified the marking of reserve boundaries by timber contractors as one cause of the problem. Mr. Maloney, a timber technician and 20-year MNR employee, testified that in the Blind River, MNR's policy of giving timber operators more responsibility for marking reserves has been a "disaster" because the operators do not want to do extra work which they are not paid or trained to do. The result has been more trespasses involving reserves made too small or cutting outside an operator's allocation (trans: vol. 378, pp. 65593-98). Mr. Maloney said the trespasses were often unintentional, making enforcement charges difficult and causing tension between MNR and the contractors.

MNR's response is that the practice of industry marking reserve boundaries has been in the *Crown Timber Act* since the 1950s. In 1990, MNR developed a strategy for shifting more marking responsibility to the forest industry. We accept MNR's argument that necessary steps are being taken to give additional training to industry markers, that marking will only be transferred to a company when MNR is confident of its competence and MNR will do random or regular inspections of boundary locations before cutting, depending on experience with that licensee and/or MNR staff availability (Ex. 2251B, #148). We rely on the area inspection reports to provide additional information about any weaknesses in the system that need correction and these requirements are found in Condition 78(c). We are also persuaded that OPSEU's concerns should be addressed, and Condition 54 requires:

54. MNR shall ensure that the location of access road corridors and locations, landings, water crossings, reserves, buffers, and harvest blocks, shall be accurately mapped and clearly flagged. Such flagging shall occur before the commencement of timber management operations, and shall be routinely monitored by MNR during and after these operations to ensure compliance with the flagging and other prescriptions and operational restrictions.

Full-tree Harvest and Full-tree Chipping

All parties agreed with MNR's proposal for a 20-year study of the effects of full-tree harvest and full-tree chipping on long-term forest productivity (Condition 101). MOEE and FFT were the parties most concerned about this issue, based largely on scientific articles which caution against increased removal of nutrient-bearing material from the site when full-tree logging methods are used.

Because of the rapid escalation of the use of full-tree logging (which was estimated to have increased from 15% of the harvest in 1985 to 64% in 1989, and may now be higher) and uncertainty over its long-term effects, MOEE supported MNR's proposed study, but was concerned about the effects that could occur in the 15 to 20 years before the studies are complete. In the interim, MOEE proposed that logging methods that remove the majority of the branches, stems, tops, needles and leaves from a site shall not be used on very shallow and shallow sites or sites otherwise susceptible to nutrient depletion. Marginal sites may be harvested in the winter, with snow present. MOEE also proposes that exceptions to this condition be allowed subject to a reporting requirement.

FFT also supported MNR's proposed study, but suggested that the proposed methodology and other particulars of the study be subject to public review and comment prior to the commencement of the study. FFT proposed that full-tree logging or chipping be restricted to highly productive sites with rich mineral soil at least 1 metre deep. Where full-tree logging or chipping may be carried out in hardwood stands, the harvesting would be conducted in the winter with snow present.

The question before us is whether the steps that MOEE and FFT have proposed are necessary, or practical, in the interim. OFIA submits that there is no reliable scientific evidence which warrants restrictions on full-tree harvesting, although there is evidence which suggests that it should be studied. MNR submits that there is little or no risk for long-term site productivity problems relative to full-tree logging in the Area of the Undertaking.

The parties urging restrictions on full-tree logging relied in part on a paper published by V.R. Timmer, H.M. Savinsky and G.T. Marek in 1983 (in Ex. 416A, pp. 451-67) looking at the potential impact of "intensive harvesting" on nutrients in four boreal forest sites in the Nipigon district. FFT and MOEE also cited a literature review by S.M. Maliondo in 1988 (Ex. 1408A, in Sourcebook for FFT Witness Statement No. 1) which lists studies on the topic and draws conclusions. MOEE witness Bernie Neary described the literature review by Maliondo and research by others as "the best that is out there right now," and said it was sufficient to warrant precautionary action, considering that the results of new studies might not be available for 20 years (trans: vol. 376, p. 65434).

We find that scientific evidence with respect to impacts of intensive logging on certain site types is cautionary rather than definitive. The expert opinion of FFT witnesses Dr. Hutchinson, Mr. Marek and Mr. Benson and MOEE witness Mr. Neary conflicted with the opinions of MNR witnesses Mr. Armson and Mr. Greenwood, and OFIA witness Dr. Methven. We are more persuaded by the experience of Mr. Armson (trans: vol. 392, pp. 67528-9) and Dr. Methven (trans: vol. 194, 34392-7).

Mr. Armson, a former chief forester of Ontario, catalogued the errors and inadequacies in the Maliondo review and said it did not have "any scientific value" (trans: vol. 392, pp. 67533-37). We cannot agree with Mr. Neary of MOEE that this paper is the best scientific evidence available and should be the basis for ordering restrictions in current forestry practice in Ontario. Mr. Armson also pointed out that the Timmer, Savinsky, Marek study itself said its recommendations were only applicable to the Nipigon region, and that a paper by the leading forest soil scientists M.K. Mahendrappa, N.W. Foster, G.F. Weetman and H.H. Krause had counselled "extreme caution" in drawing inferences from conventional methods of estimating available nutrients, such as those used in the Nipigon study.

Mr. Greenwood (in Ex. 416A, MNR Panel 10 Witness Statement) described how foresters could prevent, minimize or mitigate reduced productivity on those sites that appear to be most vulnerable. MNR intends to develop interim direction concerning site productivity, to develop a report that describes good practices on sites where there is a concern and to summarize that information and include it in an environmental guideline (see Condition 94(b)) which MNR expected to be completed in approximately 14-16 months (trans: vol. 387, p. 66678). We accept this as a satisfactory interim measure during the term of our approval.

The proposals from MOEE and FFT, which apparently would require mapping soil depths of all stands eligible for harvest throughout the vast Area of the Undertaking, appear to us to be completely impractical. The evidence made clear that various factors other than soil

depth are involved in determining which shallow or marginally fertile soils should be considered vulnerable to nutrient depletion.

In addition, we heard evidence that nutrient loss may not inhibit reforestation. Dr. Methven for OFIA and Mr. Armson for MNR said intense fires remove more nutrients from forest sites than does full-tree logging, without interfering with the growth of new forests. Mr. Armson described sites, both in southern Ontario and in the Thessalon area, "that had been reduced by man to about the extreme in infertility" by overfarming, but then produced healthy pine forests that are now 70 years old (trans: vol. 392, pp. 67519-22).

We are also encouraged by the evidence of OFIA Reply witness Bill Roll, who indicates that full tree harvesting equipment such as the Roto-Lim will leave more slash material on site (Ex. 2245; trans: vol. 385, pp. 66391-94). We believe this satisfies MOEE's proposal for redistribution of branches, tops, needles and leaves on sites where soils are shallow. Mr. Roll also said the new harvesting equipment was not taking smaller-diameter trees, which MOEE had feared would increase the amount of nutrients taken off harvest sites (trans: vol. 385, p. 66405). He also pointed out that the new equipment allows for smaller landing sites, addressing a separate concern raised by some parties about losses of productive forest to landings.

Wasteful Practices

The sight of logs left to rot on cutovers or in piles by the roadside offends the public. At the Ottawa hearing, Alfred Beck summarized the viewpoint that all wood cut but not hauled to mill is wasteful. "Such frivolous and shameless waste of Canada's greatest asset, our forest resource, must be stopped," he said (trans: vol. 333, p. 58572). The same point was argued by the Canadian Paperworkers Union (trans: vol. 232, pp. 42293 and trans: vol. 238, p. 43163) among other groups and individuals. In community after community, witnesses offered testimony and pictures of wood cut and left behind in the forest.

MNR's position is that there are acceptable and unacceptable reasons for leaving cut logs on site. Sometimes stands with low volumes of merchantable timber are harvested because they have been damaged by insects, disease, or fire or to allow regeneration into more productive stands (Board Interrogatory 180). Site preparation and clearing for road rights of way can also result in wood being left in the forest. The Hon. Howard Hampton, then an opposition member of the Legislative and now the Minister of Natural Resources, told us at the 1990 hearing in Fort Frances of a road building operation during which 16,000 cords of wood were left behind to rot (trans: vol. 205, pp. 36423-24). MNR says it is

unacceptable when timber defined as merchantable by the *Crown Timber Act* is cut and left unused. MNR claims this is an infrequent occurrence.

Increasing the Use of Wood Harvested

Did we receive better ideas at the hearing for maximizing wood utilization? MNR argues that the utilization standards in the *Crown Timber Act*, such as its definition of wasteful practices (s. 26(1)), penalties for wasteful practices (s. 27), prohibition of wasteful practices (s. 29) and authority for MNR to seize merchantable wood that has been abandoned without payment of Crown dues are adequate means of controlling wasteful practices. MNR staff routinely monitor recent and ongoing harvest operations under the area inspection program and take appropriate actions where wood is left in the bush (Board Interrogatory 177). MNR argues that they know where wood is left on site and the reasons for it.

Forests for Tomorrow proposed a definition for wasteful practices different from that found in the *Crown Timber Act* but provided no evidence to convince us that their approach would be an improvement over the provisions of the Act. George Marek submitted that merchantable wood is being left on site because of the inadequate definition of merchantable in the *Crown Timber Act*. But we received no evidence convincing us of specific changes that should be made to the definitions in the *Crown Timber Act*.

We understand that the forest industry's ability to use timber depends on the species, size and quality and the type of logging and wood processing equipment employed. MNR relies on the economic incentive for companies to get harvested wood off cutovers and to the mill in a timely manner before the timber deteriorates (Board Interrogatory 66). Many forest companies also conduct their own post-harvest inspections to satisfy themselves that all merchantable wood is removed (Board Interrogatory 177).

The intervenors identified the objective of using more poplar, often left behind on cutovers during logging of more valuable conifer species. We reviewed the evidence of John Duncanson, a financial analyst with expertise in the forest products industry and an MNR witness, who testified on new technology in kraft pulp mills which is increasing poplar utilization (trans: vol. 40, p. 6707; trans: vol. 41, p. 6979). We also received evidence on the forest industry's initiative in using smaller diameter wood for pulp and lumber (trans: vol. 188, p. 32968). Technological change has improved wood utilization and offers promise for more gains in the future. We are satisfied that these industrial processes are evolving toward a more efficient use of the resource and we make no findings about them.

Slash

The public complained that slash material (i.e., tree tops and branches) left on the cutover is wasteful and unsightly. MNR argues that slash left on site has positive benefits in assisting natural regeneration, providing wildlife habitat and preventing soil erosion, compaction and drying. Slash also has negative effects. It can create physical barriers for artificial and assisted natural regeneration, provide a potential fire hazard and its unsightliness irritates the public. MNR treats slash by piling or moving it off site in windrows or to landings. Infrequently it is burned, and on 60% of sites, it is aligned or redistributed over the site to make way for tree planters or to assist natural regeneration. We disagree with MNR's view that aligning and redistributing slash does not make it look any better. We accept that hauling slash off site is prohibited by cost and lack of landfills and that there are important silvicultural reasons for keeping slash on site. We were told that slash is being utilized today at some locations for full-tree chipping (trans: vol. 385, pp. 66409-10).

Scaling

The system of scaling (i.e., measuring timber for the purpose of payment of Crown charges) was criticized as a contributing factor to wasteful practices. We are satisfied with MNR's evidence that while a large proportion of scalers are non-MNR staff, MNR adequately regulates scaling by licensing and training all scalers. They must be recertified every three years by attending a scaler refresher course. MNR conducts audits and periodic checks on scaling, and the *Crown Timber Act* provides for penalties for infractions including the removal of scaler licences (s. 46), and for seizure and retention of timber by MNR if it is not measured in a prescribed manner (s. 22 (1)). The removal of Crown timber from the harvest site prior to scaling is prohibited by s. 43 of the *Crown Timber Act* unless approved by MNR staff (Board Interrogatory 65).

Waste Wood to be Used for Fuel

Using unmerchantable timber (i.e., wood left on the cutover or in piles following harvest) for fuel was suggested as one means of reducing waste. MNR's current practice is to offer the public fuel wood permits at a minimal charge to cut wood for personal use. For safety reasons this usually happens after commercial logging is completed (Response to Board Interrogatory 178). To encourage fuel wood consumption MNR often provides maps and sometimes will do remedial roadwork to give access to fuel wood cutting areas. Some districts identify fuel wood areas in Plans and advertise their locations in local newspapers

at the beginning of each year. We are ordering provisions to be included in all Plans in Condition 45 as an incentive to maximize the use of unmerchantable and unmarketable timber, both left on the ground and standing, for fuel wood.

Stumpage

We considered proposals that lower stumpage fees be charged for small operators as an incentive for them to salvage otherwise marginal wood (trans: vol. 251, p. 45234). MNR told us that what deters salvage of such wood is not stumpage, which is a small percentage of the cost of producing wood, but the quality of the timber and availability of markets. It is, however, common practice today for MNR to use reduced stumpage fees as an incentive for operators to take timber damaged by fire, wind or insects.

The Coalition proposed that stumpage fees be charged on all wood felled but not used. The Coalition believes that wood should be left standing if there is no market or if it is too costly to deliver to the mill. It is provincial policy not to bill licensees for timber which is considered cull and the licensee is under no obligation to remove cull timber (Board Interrogatory 184). MNR acknowledges that the public may view this as waste, but it is MNR's position that some proportion of any forest stand cannot be turned into a useable product. We are not persuaded that applying stumpage fees will deter logging of stands with low volumes of merchantable timber or improve wood utilization. We find that MNR has an adequate regime for enforcing through its area inspections the wood utilization standards under the *Crown Timber Act* and the inspector can impose penalties if merchantable wood is left in the cutover. We also believe that more care must be taken to leave trees standing unless there is a reason for cutting them.

Findings

We conclude that the definition of wood wastage will likely remain a contentious dispute between the public, which is offended by wood left on the cutover for any reason, and the forest professionals, who see legitimate silvicultural and economic reasons for logging but not using certain timber. We saw what appeared to be wasted wood, but did not receive quantified evidence of how big a problem this is.

In order to determine its extent we are accepting the premise of the Coalition's proposal that the reasons for and the extent of wood wastage be reported in area inspection reports (Condition 78(b)(ii) and the annual FMU reports (Appendix 18). The public must be assured that MNR is doing everything possible to maximize the use of wood and that there

are justifiable reasons for leaving cut logs and slash on site. For this reason we are ordering Condition 40(b)(iv) for a statement to be included in every Plan predicting where wood would be left on site after logging, the reasons for this and plans for the disposition of merchantable and unmerchantable timber.

INTERVENORS' PROPOSALS

Alternative Silvicultural Systems

FFT made a case for more modified harvesting involving smaller cuts and more natural regeneration, in contrast to MNR's present practice of clearcutting and artificial regeneration. MNR estimates that for even-age, conifer cutovers in the boreal forest 30% to 35% of cutovers are treated by planting and another 15% by seeding (Response to Board Interrogatory 141). In addition, about 25% are treated by assisted natural regeneration methods and the remainder is left to regenerate unassisted. For uneven-age management in the Great Lakes-St. Lawrence forest, planting and seeding are rarely done.

In 1991, we determined that we had insufficient evidence to make a decision between the two silvicultural systems and we ordered the parties to compare the costs of the two systems. This required examining the implications for wood supply. The analysis was done by a committee representing MNR, FFT, MOEE and OFIA. Their report was presented to us in March 1992 (Ex. 2226). MNR subsequently carried out its own silvicultural costing and wood supply analysis and gave us their results in reply evidence near the conclusion of the hearing (Ex. 2265; trans: vols. 387 and 388). We discuss the results of these analyses below, then we make findings on FFT's silvicultural planning proposals. These analyses are extremely complicated to understand and the reader is referred to the full texts of Ex. 2226 and 2265 for the detailed discussion of how the analyses were done and how the results were interpreted.

Cost Comparisons

The results of the committee's analysis, using a 142,164-hectare study area in the boreal forest, show that by conducting silviculture according to FFT's proposals, the annual silvicultural costs (i.e., for site-prep, logging, planting and seeding, tending and protection) could range from \$78.2 million to \$163.6 million. This compared to \$90.6 million for MNR's present silvicultural practice, which was based on actual 1991-1992 spending on silviculture by MNR in the three northern regions. A separate calculation of road costs for 20 years showed an average yearly cost for road construction of \$32 million for the FFT alternative

(to be spent in the first 10 years) and \$35.5 million for MNR's present practice (spread over the 20 years) in addition to the silvicultural costs (Ex. 2226, p. 20).

The four authors, all foresters, had differences of opinion about the translation of FFT's silvicultural prescriptions into operational terms for the analysis and about assumptions for road costs and, therefore, could not reach a consensus on the results and conclusions contained in the report. We were given the personal comments of each committee member on the report's findings (Ex. 2226, pp. 64-84). The authors did agree that the assumptions used in the analysis would likely be different than the decisions made in the field by foresters, who could achieve the same objectives at costs that could be greater or less than the analytical results. This observation supports our finding (see p. 81 in Chapter 3) that the professional judgement of foresters should not be constrained by inflexible "rules."

FFT disputed assumptions used in the cost analysis, especially for strip cutting and tending, and MNR's speculation about costs for road maintenance and reconstruction. We disagree that the assumptions were used unfairly to inflate the costs of FFT's proposed silvicultural alternatives. Road maintenance and reconstruction costs were entirely excluded from the analysis, but we agree with Ron Waito, an MNR witness and co-author of the report, that some of these road costs would likely be incurred to do return cuts 10 to 20 years after harvesting the first strip (trans: vol. 388, p. 66963). FFT criticized the use of a 1979 Ketcheson Canadian Forestry Service Report on the cost of strip cutting in black spruce stands, but we are satisfied that the mid-range of \$180 per hectare was selected rather than the high range of \$383 (Ex. 2226, p. 46). FFT subsequently eliminated its guidelines for strip cutting black spruce. While this could lower the estimated road costs and the overall costs of FFT's alternatives, we have no figures for this. Mr. Rick Lindgren, counsel for FFT argued that the cost estimates assumed more expensive manual tending and ignored the fact that FFT's silvicultural regime permits ground spraying of herbicides. Mr. Waito's evidence indicates that some attempt was made to incorporate ground spraying of chemicals in calculating the costs of one of FFT's alternatives (trans: vol. 388, pp. 66922-24). MNR argued that the primary reason FFT's proposals would almost always cost more than MNR's current practice is that FFT's alternatives call for the elimination of aerial herbicide applications. The costs of ground spraying are higher in any event than the aerial spraying of herbicides used in MNR's present practice. These costs are discussed in Chapter 7, pp. 239-240.

Counsel for FFT also criticized the analysis for ignoring the possibility of larger cuts allowed by FFT's provisions. Mr. Waito responded that FFT's guidelines as written at the time of the cost comparison exercise required, in his opinion, that 90% of the study area would be harvested in blocks 50 hectares or smaller for black spruce strip cuts and for poplar and

white birch with the exception of 100-hectare cuts for jack pine (trans: vol. 388, pp. 66894-95). Black spruce alone made up 45% of the study area. Mr. Waito did agree with Mr. Lindgren that if FFT's guidelines allow larger cuts, this would have the effect of reducing the estimated cost of FFT's silvicultural alternatives. Again, although FFT subsequently replaced its original proposals for strip cutting and 50-hectare cuts for some species with a 100-hectare clearcut size limit, we have no evidence on how this would affect the cost estimates. We accept Mr. Waito's view that in the absence of strip cutting requirements the cost would decrease. Mr. Freidin, counsel for MNR, argued that FFT's silvicultural prescriptions still require many 100-hectare clearcuts, which would increase road and layout costs for modified cutting. He said other FFT requirements for tree-length logging on sites where soil depth is less than 1 metre, restrictions on full-tree logging and prohibition of aerial herbicide spray would keep the cost of FFT's alternatives higher than MNR's present practice (Ex. 2226, pp. 46-53).

We conclude that FFT's alternative of using more natural regeneration appears to be less costly in the lower estimated range than MNR's present practice (i.e. \$78.2 million versus \$90.6 million) on the basis of silvicultural spending assumptions used in the cost analysis only. This must be considered, however, with the results of the wood supply analyses discussed below indicating that lower volumes of conifer supply would be obtained at a higher cost with FFT's alternatives. For our decision, we believe the cost analysis is more relevant to the question of natural versus artificial regeneration than for modified cutting versus larger clearcuts because strip cutting for black spruce was assumed as a major cost factor but this requirement has been removed by FFT.

Implications for Wood Supply

Can we predict the effects on wood supply of using the two different silvicultural systems? The results of the analysis suggest that FFT's preferred approach of using only natural regeneration (versus MNR's present practice of artificial and natural regeneration) would produce a lower annual sustained even flow of conifer: an estimate of 700,000 cubic metres for FFT's first scenario in the study area compared to 774,000 cubic metres for MNR's approach. The second FFT scenario, assuming some artificial regeneration, was also analyzed and showed the highest level of sustained even flow of 823,000 cubic metres (Ex. 2226, p. 35).

Associated with these estimates of wood supply are additional cost estimates, which are Mr. Waito's interpretation of the data. We note that the committee could not agree to include these in the formal part of its report (trans: vol. 388, p. 66915). These suggest that FFT's

first scenario of natural regeneration is two times more costly to treat silviculturally and over the long term, 20% more expensive than MNR's present practice (\$102 million). FFT's second scenario of natural and artificial regeneration is three times more expensive to treat silviculturally and 110% more expensive over the long term (\$155 million) than MNR's present practice (\$90.6 million) (Ex. 2226, p. 66).

The authors warned us that the wood supply analysis results must also be interpreted cautiously: the analysis was done for only one management unit (the Spruce River FMA) and the results cannot be applied to the rest of the province; the FORMAN computerized simulation model used gives results specific to the management unit (trans: vol. 388, p. 66906); and the study period of 100 years examined growing stock and not the amount of conifer available for harvest. A particular problem with the analysis was that the costs of the present practice were confined to \$90.6 million but no ceiling was put on the costs required by FFT's scenarios to carry out silviculture to produce sustained even flow of conifer. It was reported to us that the committee did not have time to do an analysis using equal funding levels (Ex. 2265, p. 11). It was Mr. Waito's opinion that an analysis capping spending on FFT's alternatives would result in lower conifer regeneration success levels and therefore a lower conifer even-flow level (Ex. 2265, p. 11).

We agree with the conclusions reached by Mr. Waito: relatively similar even flows were achieved for each of the three scenarios but at what appear to be higher costs for FFT's alternatives, and different silvicultural systems give different results for conifer wood supply (Ex. 2265, pp. 10-11). We also agree with the observations of the OFIA representative on the committee, Mr. Mac Squires, a divisional forester with Abitibi-Price Inc., who concluded that under FFT's silvicultural proposals, wood supply cannot be sustained at current levels. He gave three reasons: without aerial herbicide application, there is limited if any ability to tend the sites with the best potential to enhance growth; rotations dependent on slower natural regeneration will be longer; and yield will be lower on richer sites where the dense regeneration necessary for spacing control and full production potential will not be obtained (Ex. 2226, p. 72). Mr. Squires concluded: "The results will be wood shortages of critical species within economic range of existing manufacturing plants and increased harvesting and hauling costs brought about by lower yield and increased distance." In his opinion, "Ontario mills dependent on natural regeneration will be unable to compete in this changing world" (Ex. 2226, p. 73).

Following the cost comparison exercise, MNR conducted its own wood supply analysis at the provincial level in which yield curves were developed for 60 management units to compare FFT's alternatives and MNR's present practice. Silvicultural treatments were classified into three regimes: intensive (i.e., planting), basic (i.e., assisted natural regeneration and seeding)

and extensive (i.e., untreated) silviculture. Most important, the comparison assumed a cap of \$90.6 million spending annually for FFT's two scenarios and MNR's present practice. This work was done by Brian Callaghan, an MNR forester with expertise in analyzing and modelling wood supply and yield regulation. The results of the silvicultural costing analysis done by Mr. Callaghan suggest that in 60 years the growing stock volumes of the three silvicultural alternatives would be within 10% of each other, an estimate of 14.7 million cubic metres for MNR's approach, 13.5 million cubic metres for the FFT scenario relying primarily on natural regeneration and 14.1 million cubic metres for FFT second scenario which was assumed to have some artificial regeneration as well. The most important finding was that FFT's regimes would likely provide a significant shift away from conifer towards more hardwood content (trans: vol. 387, p. 66732). MNR's present practice is predicted in this analysis to result in a forest similar in composition to that found in the 1986 forest resources inventory of Ontario – 71% conifer and 29% hardwood – as compared to FFT's natural regeneration regime expected to produce a forest composition of 54% conifer and 46% hardwood and FFT's silvicultural approach including some planting that is predicted to produce volumes of 59% conifer and 41% hardwood (Ex. 2265, p. 13).

FFT criticized Mr. Callaghan's analysis for selecting a pre-rotation age of 60 years, which Mr. Lindgren argued would somehow ignore the maximization of annual increment (MAI) in the FFT scenarios, but we accept Mr. Callaghan's explanation that 60 years is a pre-rotation age which puts the three alternatives on an equal footing (trans: vol. 388, p. 66928). FFT also disputed Mr. Callaghan's results by referring to the 90% conifer content calculated in the first cost exercise for FFT's natural regeneration alternative applied to one management unit (Ex. 2226, p. 200) compared to findings of 80% conifer for MNR's present practice (Ex. 2226, p. 202). We accept Mr. Callaghan's opinion that the softwood content for FFT's alternative was mostly balsam fir. He said MNR's would produce a higher level of black spruce, which is the more merchantable species required by industry (trans: vol. 388, pp. 66925-26).

We are persuaded that a greater reliance on natural regeneration and a reduction in artificial regeneration methods would reduce the conifer content in our forests, to the disadvantage of the forest industry.

FFT's Silvicultural Planning Proposals

FFT wants MNR to develop and implement silvicultural ground rules that will maintain the forest's long-term ecological sustainability and biological diversity and cause no site damage or productivity loss (FFT Condition 27). FFT characterizes these objectives as general

principles, but we conclude that it is not feasible to include these in the Conditions of Approval. We are ordering MNR in Conditions 100 and 107 to continue investigating the means for ensuring sustainability and biological diversity. We believe that proper and appropriate methods of conducting timber operations are provided in the Implementation Manuals and that a statement of general principles on these matters is not necessary or enforceable.

FFT proposed that MNR be required to satisfy 10 criteria in developing silvicultural prescriptions. These criteria involve issues associated with landscape management, including wildlife habitat, and more reliance on natural regeneration (FFT's Condition 28). We do not accept these proposals because we are ordering MNR to investigate the feasibility of landscape management and wildlife habitat supply methodologies in Condition 107. We are rejecting proposals that promote more natural and less artificial regeneration and our reasons are discussed in Chapter 6.

As discussed above, in October 1992 FFT withdrew its silvicultural guideline proposals for strip cutting of black spruce and 50-hectare cut limits for other species and replaced them with a proposal that MNR be required to implement a range of smaller cuts up to 100 hectares. Where clearcuts, either individual or contiguous, exceed 100 hectares, FFT is calling for these to be identified in the Plan and the rationale provided for the size of the cut (FFT Condition 29).

We do not accept FFT's proposal that only the uniform shelterwood method be used to harvest white and red pine and also that pine be treated mostly by natural regeneration. We are persuaded by MNR's evidence and experience that the uniform shelterwood method can be successful in sustained natural regeneration of pine only on certain sites. In others clearcutting is necessary if regeneration of pine is desired (Ex. 2295, tab. 3, Ex. 2195A).

We disagree with FFT's proposal that the logging of tolerant hardwood species should be restricted to shelterwood or selection harvest systems. MNR acknowledges that these methods are best suited to the natural regeneration of tolerant hardwoods and are in almost exclusive use in Ontario. It says, however, that there are circumstances in which clearcutting of hardwoods is justified, such as opportunities to increase regeneration of yellow birch, basswood and ash in poor quality stands (Ex. 1600, Silvicultural Guide for the Tolerant Hardwood Working Group in Ontario) and for converting invading tolerant hardwood stands that are presently occupying sites which were previously dominated by white pine (Ex. 2295, tab. 3).

FFT would permit few exceptions to its silvicultural guidelines and only three are identified: for wildlife habitat, to satisfy the management objectives for non-timber values or to satisfy FFT's silvicultural principles and criteria. We find FFT's allowable exceptions to be inadequate because they ignore the site-specific silvicultural conditions and operational and economic factors that foresters need to consider in making timber management decisions.

Mixed Wood Silvicultural Guide

In its final argument, MNR stated that a silvicultural guide will be produced by suitably qualified individuals for use in developing Silvicultural Ground Rules for the boreal mixedwoods in the area of the undertaking. This concession was offered in the face of proposals by OFIA and FFT to provide a specific implementation manual for the 40% to 50% of the Area of the Undertaking which is covered by mixed wood forest. During Reply evidence, Frank Kennedy on behalf of MNR estimated that it would take 18 to 20 months to prepare. We agree that there is merit in providing this new implementation manual and provide Condition 94(d) for this purpose.

Single Use Forestry

George Marek's idea for segregating timber production on intensively managed, artificially regenerated plantations close to mills (trans: vol. 256) where as much of industry's needs as possible could be met interested us as a solution to the conflict between timber and non-timber users. The larger portion would then be given over to a multiple-use, naturally regenerating forest where few timber operations would be permitted. Under MNR's approach, timber is supplied from most of the forest land base with 30% of cutovers intensively managed as MNR defines it – but much less intensively than Mr. Marek is proposing – and the rest left to natural regeneration.

Dividing the forest into special areas and isolating industrial forestry is appealing but we conclude it will not work for two reasons. First, MNR calculates that even if very intensive management were started today on 30% of the land base (and MNR contends that the money and labour force is unavailable for such an enterprise) we cannot expect to harvest these areas before 40 to 60 years or longer. MNR argues that industry will be relying on significant amounts of timber from the greater portion of the forest not managed intensively for a very long time to come (Board Interrogatory 57). There is no agreement among the non-timber users on how the multi-purpose forest should be managed. Michelle Swenarchuk, counsel for FFT, submitted that dividing the forest into two or more classes would not eliminate conflicts and FFT is proposing a more fundamental change to land use

planning for the forest (trans: vol. 266, pp. 48196-201). FFT's proposals for integrated forest management are discussed in Chapter 11, p. 379.

European Style Forestry

Although dissuaded from accepting Mr. Marek's proposals, we found his evidence about the industry plantation approach, which is based on the style of forestry carried out in Europe, to be a useful idea for our consideration.

The Ontario public sees the Europeans as doing a better job with forestry, if for no other reason than they have had hundreds of years of experience.

Ontario's forests are most often compared to Sweden's but there are important differences (Ex. 2251B, Interrogatories 21, 22 and 23). Ontario has many more tree species, and the most important commercially – jack pine and black spruce – have significantly different characteristics than Scandinavian species. The control of competing vegetation is a larger problem in Ontario. Natural Scandinavian forests have been managed for 100 years to maximize timber crops (with higher yields per hectare than Ontario) while our boreal forest is being accessed and placed under management for the first time. In Sweden, 30% of the annual harvest comes from a sequence of thinnings, there has been a large scale forest fertilization program since the 1950s, and drainage is a common Scandinavian management technique. None of this is true for Ontario. Almost 50% of Sweden's forests are privately owned (in 240,000 separate holdings) compared to the Crown's ownership of the entire Area of the Undertaking; the scale and type of forestry are consequently different. In Sweden, where clearcutting is a standard harvesting system, 70% of the annual cut is planted compared with 30% to 35% in Ontario. In Sweden, 80% of the cutover is treated by mechanical site preparation compared with about 40% in Ontario (Response to Board Interrogatory 23).

Although there are problems with the European approach to forestry, particularly with respect to monoculture plantations, we conclude there are at least two aspects of the European experience that could benefit our timber management. The first is their reliance on artificial regeneration, and we discuss this in Chapter 6.

The second interesting aspect is the size of forest areas managed by Swedish foresters, approximately 10,000 hectares, compared to a forester in Ontario who is often responsible for 200,000 to 400,000 hectares. Dr. Baskerville observed that the 50:1 difference in overall professional staffing levels between Sweden and Ontario implies that we have less

management control over our forests and slower response to changes (trans: vol. 168, pp. 29813-26). He said we need to recognize, however, that in Ontario we will always be doing extensive management on large areas, while in Sweden they need to manage intensively on very small areas.

We also appreciate the arguments of the intervenors that contemporary forest management requires more than the skills of foresters; it also requires the expertise of wildlife biologists, technicians, socio-economists and ecologists.

For these reasons we conclude that it would be unreasonable for us to order MNR to employ more foresters. We believe our decision identifies the central importance of foresters in timber management planning, and makes these professionals even more responsible and accountable.

We conclude that the European forestry model, shaped by hundreds of years of history, cannot be imported for our comparatively new management of a predominantly older age class forest, most of which will not come under timber management for many years.

Cost-Benefit Analysis

Andrew Muller, an economist and FFT witness, conducted what was described as an "illustrative" cost-benefit analysis for the purpose of finding the best social net present value (NPV) of forest services and benefits such as wildlife, recreation, silviculture and roads. He recommended that social cost-benefit analysis be one of a number of factors used by MNR to make timber management decisions (trans: vol. 290, p. 51765). Dr. Muller compared four different systems for a hypothetical FMU: (a) non-timber users only; (b) modified cutting, with a two- or three-coupe system and ten years between each (an enhanced natural regeneration); (c) large area clearcutting and artificial regeneration (described as MNR's current practice) and (d) clearcutting and unassisted natural regeneration (Ex. 1695C).

Dr. Muller's results gave a positive NPV only for non-timber users. The least negative NPV was FFT's preferred alternative of a three-coupe modified cut and assisted natural regeneration (assuming medium interest rates, low yields and low prices for wood). He concluded that MNR should be using financial analysis to determine if forest areas should be devoted to timber management or to competing land uses such as fishing and hunting (trans: vol. 289, p. 51719). His second conclusion was that modified cutting and assisted natural regeneration have a lower measured cost than clearcutting and artificial regeneration, a subject we discuss above and in Chapter 6.

We do not challenge Dr. Muller's use of conventional economic theory but in our opinion his analysis does not deal with the reality of the forest industry and timber management planning in northern Ontario. Dr. Muller defined the value of timber to be \$50 per cubic metre for the delivered price of wood at the mill minus the cost of logging, transportation, planting and building roads. This assumption ignores the evidence of an inextricable link between logging and the greater value of timber used by the mills to make lumber and pulp and paper products, the value of mill employment (less than 10% of jobs in the forest industry are in logging) and economic benefits to local communities and supplier industries. We find the analytical approach to be unrealistic in assuming that forest workers could find alternative employment without relocating, essentially giving their houses away, or at similar wages. We also find the assumption that government would compensate for lost jobs and relocation a highly unlikely scenario.

Dr. Muller's results are not surprising because, as he points out, we learned early in the hearing from Peter Hynard, an MNR forester and co-author of the publication "A Decision-Making Model for Forest Managers Using Economic Considerations," that the standard formula found in the literature for calculating NPV will most often be negative. Such cost-benefit effective analyses done on silvicultural efforts give a negative result because the stumpage paid to government will rarely justify its investment in silviculture and the calculation of interest and other costs of an investment taking place today for a benefit that will occur after an 80-year rotation (Ex. 603C). As we discuss in more detail in Chapter 9 (p. 331), government makes these expenditures anticipating a broad range of benefits to the people of Ontario.

We are not convinced that Dr. Muller's attempts to put economic values on non-timber resources give realistic or reliable results. For example, we do not have evidence that respondents to a survey would in fact be "willing to pay" to have the forest devoted to wilderness or recreation if they were put to the test of actually opening their wallets. Dr. Muller also testified that he knows of no specific studies of estimating the value of non-marketed services in the Area of the Undertaking (trans: vol. 286, p. 51167) and that measurements by contingent valuation can give extremely imprecise estimates (trans: vol. 286, p. 51169). We conclude that the assumptions used in Dr. Muller's cost-benefit analysis underestimate the economic benefits of timber and give theoretical, unproven values for non-timber resources. But we believe MNR must develop appropriate technologies for estimating values of non-timber resources.

We appreciate the need for research to find ways of giving market values to environmental resources. In our society where money talks, advocates of environmental protection have fought to establish a monetary comparison for the value of non-industrial forest users against

the more easily measured billions of dollars in forest industry investment, infrastructure, employment and other economic and community benefits. In the U.S. National Forests this is changing because the money spent by many millions of tourists annually can be favourably compared to the economic value of the timber industry that is dependent on those forests. This is not the evidence we have seen for northern Ontario and we discuss our findings on this matter in Chapter 9.

For these reasons we agree with MNR's argument that it would be risky and of limited value to order, as FFT proposes, that cost-benefit analysis be done for each Plan at this time. First, we must develop valuations of the social and economic cost and benefits that are appropriate for analyzing timber and non-timber resources in Ontario. In Condition 104 we order MNR to proceed with the socio-economic research initiated in its forest values program and we describe this work in Chapter 9.

CHAPTER 6

REGENERATION: HELPING THE FOREST GROW BACK

INTRODUCTION

The need for renewal of the timber resource was undisputed at the hearing but we heard different arguments about how the regeneration program should be done. The forest industry, supported by commercial tree nurseries, wants more artificial regeneration. Members of the public who appeared at our community hearings made clear they want government and industry to do whatever is necessary to replace harvested forests. FFT contended that natural regeneration is less costly than artificial methods and can be successful under the right circumstances.

The evidence we heard convinces us that the effects of forest renewal are generally positive. FFT argued that site-preparation such as scarification could damage the forest floor. We conclude that these potential impacts are less significant than the effects of harvest, which we found in Chapter 5 that MNR could prevent or mitigate through the timber management planning process.

The majority of our timber supply comes from conifer species in the boreal forest. About 30-35% of this even-aged harvest is being regenerated by planting, another 15% by seeding and the remainder by planned and unplanned natural regeneration. Virtually all of the uneven-aged harvest, mostly in the Great Lakes-St. Lawrence forest, is regenerated by natural methods. Most harvest and regeneration now takes place on Forest Management Agreement lands, so these companies and their agreements with the Ontario government are prominent in any discussion about forest renewal in the area of the undertaking.

Below we describe the methods used to prepare sites for regeneration treatments, the planting and seeding techniques known as artificial regeneration and the different methods of natural regeneration, both "planned" and "unplanned." We also discuss how foresters decide whether artificial or natural regeneration is the preferred treatment for a cutover. We conclude that a variety of regeneration methods is appropriate for different site conditions and necessary for successful regeneration across the area of the undertaking.

We look at the "regeneration gap" that was identified as a concern at the hearing and we conclude that there are acceptable reasons to explain why the areas receiving regeneration treatments appear in statistical reporting to be falling behind the areas harvested for timber.

We consider the issue of regeneration success and conclude that the weight of the evidence is persuasive in demonstrating that we are achieving successful regeneration. This evidence includes MNR's Free-to-Grow approach to measuring regeneration success, the experience of FMA companies in achieving high stocking standards and the impressive experience of MNR and OFIA renewal experts.

We are persuaded by the evidence that the forest is growing back after the timber is harvested. We have described our site visits (p. 19) for which parties were invited to direct us to adverse effects. We did not observe, as the public fears, that there are barren wastelands or biological deserts of logged cutovers that are not regenerating. We learned that the forest grows back whether we plant trees or leave it to regenerate naturally. The problem with relying completely on natural regeneration is that the jack pine and spruce species prized by industry will regenerate more slowly and in smaller volume because of competition from other species such as poplar. We are convinced that artificial regeneration is necessary to achieve the purpose of supplying timber to the forest industry, and as we have found by this decision, this purpose is consonant with the purpose of the *Environmental Assessment Act*.

We were unconvinced by FFT's arguments that we should do more natural and less artificial regeneration. The most important aspect of all the evidence on this question is that artificial methods are essential to renewing jack pine and black spruce on certain sites. Without it, the future conifer supply relied on by industry would be adversely affected. We accept MNR's position that natural regeneration is successful for some sites and species but that there will always be a need for an artificial regeneration program.

We examine proposals on nursery stock production and tree planting and order Conditions of Approval that we believe are practical and responsive to the identified concerns. We are persuaded that similar renewal standards and their monitoring should be applied equally to all three types of management units – FMAs, Crown and company – and we order a condition on independent audits to accomplish this goal.

We are worried by what we see to be MNR's decreasing financial commitment to regeneration, since this is likely to have adverse effects on future wood supply and sustainable yield management. We order Conditions of Approval to ensure that MNR gives priority to renewing timber harvest areas.

HOW IS THE FOREST RENEWED? ALTERNATIVE METHODS OF RENEWING THE FOREST

Site Preparation

Harvest sites can be prepared for regeneration, either artificial or natural, using machines, prescribed burns or chemicals, alone or in combination. Slash, which is the leftover tops and branches of harvested trees, is removed or realigned. Competing vegetation and the forest floor are then treated to promote the success of the desired species for the new forest. We can see in Figure 6.1 that 84% of the area site prepared between 1977-90 was treated mechanically, 8% chemically and 8% with prescribed burns.

Mechanical site preparation employs such equipment as patch scarifiers and passive or powered disk scarifiers to expose mineral soil or to mix mineral soil with organic layers. Different techniques are used depending on the site and on the tree species to be grown. The cost of mechanical site preparation was estimated to be about \$285 per hectare in 1990 (update of Ex. 532A, p. 166, MNR Question 29).

Prescribed burning uses controlled fire to dispose of excess post-logging debris, prepare seedbeds and suppress competing vegetation. To a certain extent, it imitates the natural process of renewal in the boreal forest, which was shaped historically by forest fires. We also discuss prescribed burning in Chapter 3, p. 123.

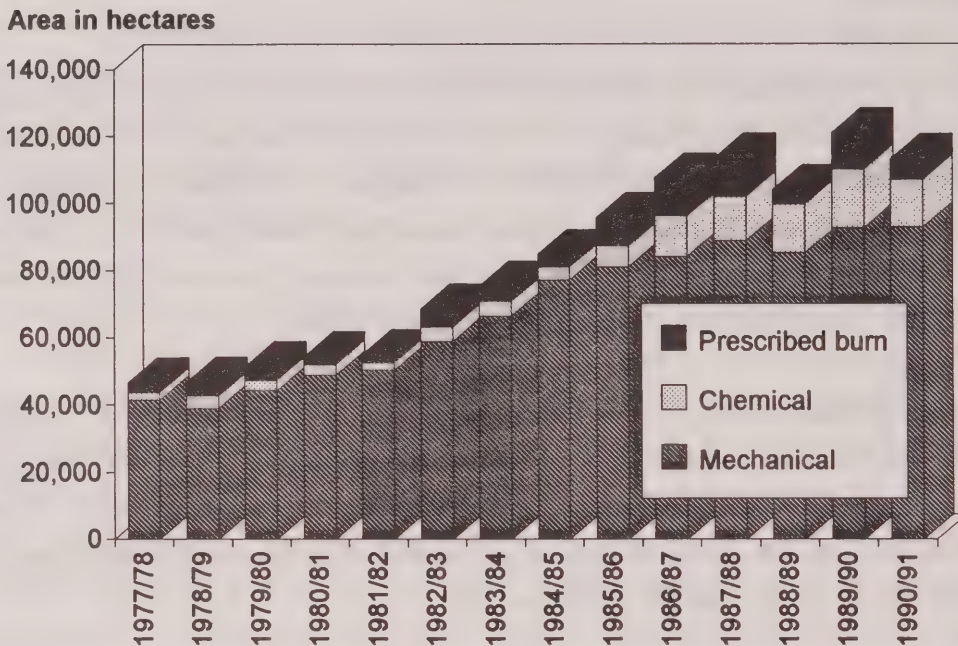
Chemical site preparation refers to the use of herbicides to destroy competing vegetation, such as heavy brush and grass cover, that would compete with the young trees. Issues related to herbicides are discussed fully in Chapter 7 on tending.

These techniques can be used in combination. In other cases, the forest manager may decide that no site preparation is needed, either because it is possible to plant or seed directly in the cutover or because appropriate regeneration can be expected without any treatment at all. Figure 6.1 shows that most site preparation is done by mechanical means and that the annual area treated by site preparation has more than doubled since 1977/78 to almost 100,000 hectares in 1990/91.

Artificial Regeneration

MNR told us that about 35% of the even-aged harvest is being treated by planting and another 15% of cutovers is being treated by seeding (Response to Board Interrogatory

Figure 6.1
Site Preparation on Ontario Crown Land by Method by Year
1977/78 - 1990/91

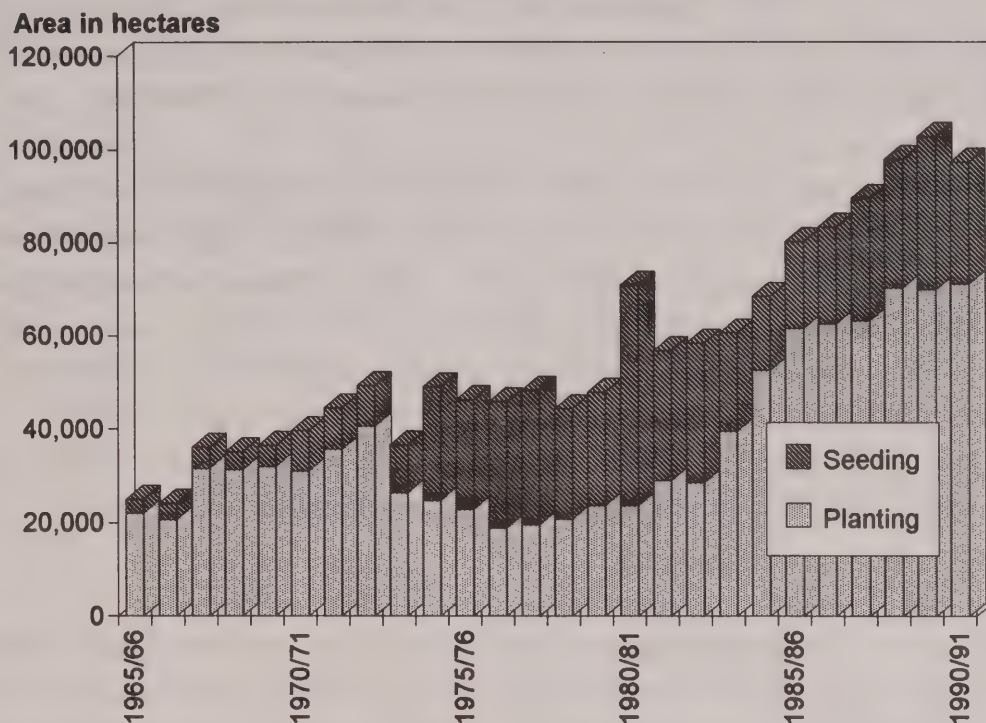


Source: Update of Ex. 532A, p. 322, MNR Question 31

60(b)). Planting is used more than seeding as an artificial regeneration method and Figure 6.2 shows that the size of the area treated by both has grown from about 20,000 hectares annually in 1966 to 100,000 hectares in 1991. This indicates that MNR has increased its effort considerably to promote artificial regeneration.

Planting tree seedlings can hasten the growth of a new forest, and increases control over density, spacing and species composition. It is also the most expensive and labour-intensive silvicultural option. On some sites, planting is the best way to ensure regeneration. But there is an inaccurate public impression that any land harvested which is not replanted is likely to remain indefinitely a barren wasteland. Even if a site is cut and left untreated, the forest will almost certainly grow back, perhaps not quickly enough and perhaps to a mix of species that is undesirable both for industry and for non-timber values such as recreation and biological diversity. In the 1992 planting year, approximately 160 million trees were planted as part of the regeneration program (update to Ex. 164, p. 11, MNR Question 28).

Figure 6.2
Planting and Seeding on Crown Land in Ontario, 1965/66 - 1990/91



Source: Update of Ex. 532A, MNR Question 26

There are various ways to conduct direct seeding, including aerial application, hand seeding and seeding in conjunction with scarification. Weather, soil and forest floor conditions have to be right, and enough seed has to be used to allow for the appetites of rodents and birds. Seeding is much cheaper than planting. In 1990 it was estimated that seeding costs about \$25 per hectare compared to more than \$400 per hectare for planting (update of Ex. 532A, p. 166, MNR Question 29). Seeding can be done from the air on sites where access for planting would be difficult. The disadvantage of seeding is a lower survival rate than is obtained from planting seedlings.

Natural Regeneration

Different methods of natural regeneration are used in Ontario's forest and each is limited by the silvical characteristics of the tree species and site conditions. Advance growth or advance reproduction refers to regeneration of a new forest from seedlings and saplings already present on the forest floor and left behind after the harvest cut. It works better for some species than others, requiring for instance relatively shade tolerant species to produce

new trees in any quantity. Careful logging around the advance growth (known as the CLAAG method) may be necessary, and even then the new forest may not be made up of the same species as the previous overstory. Another use of advance growth in Ontario is for black spruce on certain claybelt sites where a harvest/regeneration method known as HARO (for Harvest and Regeneration Option) releases advance reproduction by opening the stand to light through partial or clearcutting or natural stand breakup.

Natural seeding is how most forest stands originate following wildfire, and it can also be used sometimes as a method of natural regeneration following logging. There must be a seed source, in standing trees or in harvest slash. Some species, such as jack pine, must have their cones heated by fire or direct sunlight to release the seeds. Also required is a suitable seedbed in the forest floor and not too much competition from other species. This can be a slow process, for example seed crops may appear only every three to five years or more, and take several years to get the new crop of trees started. It is possible to combine natural seeding with site preparation, such as scarification or treatment to control competition.

The coppice method of natural regeneration produces the new forest from stump sprouts or root suckers originating from the harvested trees. Most hardwood species will sprout or sucker in varying degrees. Exposure to light is crucial, so this method can really only work in clearcuts. Early growth is very fast, making use of carbohydrate reserves in the parent root system. Most conifers will not produce sprouts or suckers.

MNR also encourages natural regeneration through modified harvest practices, such as shelterwood cuts, clearcuts with seedtrees, clearcuts with group seedtrees, strip clearcuts, strip shelterwood and uniform shelterwood methods.

How is the Decision Made between Artificial or Natural Regeneration?

Many factors must be considered in selecting a regeneration treatment. The evidence of MNR Panel 11 (Ex. 532A and Ex. 532B) and OFIA's five case studies (Ex. 1137) demonstrated the importance of maintaining flexibility and cost effective management alternatives for forest managers. MNR and OFIA witnesses also convinced us that the experience and knowledge of foresters about the past results of regeneration on similar sites is an important factor in selecting the appropriate regeneration method. We take from all the evidence on renewal that artificial and natural regeneration methods cannot be easily substituted for one another because they are suited to different species, sites and management objectives.

The forester prescribes regeneration methods in the silvicultural ground rules for each Plan (Conditions 25 and 26). One of the first considerations in selecting the regeneration method is future wood supply requirements, so the forester assesses what the nearby mill or mills are likely to need when these trees are ready for harvest. MNR told us that artificial regeneration methods are used where "the probability of securing acceptable stocking levels through natural regeneration of a species (usually conifer) is low" (Ex. 532A, MNR Panel 11 Witness Statement, p. 146). The greater reliability of artificial regeneration is preferred on sites close to mills. Conifer species represent the majority of volume harvested for mills from Ontario's forests and artificial regeneration has focused on developing ways to obtain reliable regeneration of spruce and pine. The experience with natural regeneration is that it produces superior results only with poplar, hard maple and some other hardwood species (Ex. 532A, MNR Panel 11 Witness Statement, p. 106).

In assessing site characteristics, foresters have learned that rich sites with high levels of competing vegetation often need artificial regeneration to obtain satisfactory results and that natural regeneration methods are most reliable on less productive sites (Ex. 532A, MNR Panel 11 Witness Statement, pp. 106-7). The forester must judge the competing vegetation, especially on fertile sites, which may require herbicide treatments if regeneration of conifer is the goal. Ease of access by roads may determine whether artificial regeneration is possible, and distance to mills may determine whether it would be profitable. Soil characteristics to be considered include slope, soil depth, terrain, topography, soil texture, moisture, drainage, nutrient status and organic matter thickness. Too many boulders or a high water table can prevent site preparation and planting.

Decisions about which regeneration methods could be used must be made at the same time as the harvest method because the silvicultural system is designed as a package. For example, modified cutting systems may be used to enhance natural regeneration. Prescribed burning is most feasible, if tree-length logging has been used, because this leaves lots of wood behind on the site. Full-tree logging is used more often, and following it, less intensive site preparation is required because less slash is left behind.

For artificial regeneration, the availability of trained people, equipment, seeds and seedlings for the relatively short season when planting and seeding are done can be limiting factors.

Renewal options can also be limited by the season of operation. For example, on some wet lowland organic soils, harvesting often takes place during winter on frozen soils, and site preparation is conducted on the frozen ground with winter shearblading. New harvesting equipment, such as wide-tire skidders and wide-track harvesters, now allow summer harvesting on many wet lowland organic sites.

In some areas, the need to protect wildlife or accommodate other non-timber resources may restrict the use of certain kinds of equipment or harvest methods, thus limiting the renewal options. Mr. Hynard testified that he has faced situations where non-timber users such as cottagers oppose all-weather road access and while they may not disagree with renewal treatments, lack of road access limits the use of artificial methods (trans: vol. 97, p. 16319).

Artificial regeneration is expensive and in cases where money is unavailable, the forester may have to fall back on a cheaper method or leave areas untreated for lack of funds. The issue of appropriate levels of funding for regeneration is discussed on p. 225.

We agree with MNR's conclusion that it is inappropriate to dictate artificial or regeneration methods and that these decisions must be made by the forester for each site. We accept MNR's position that due to the diversity of site conditions on most management units, many artificial and natural regeneration methods and techniques can be used successfully for some part of the renewal program on each management unit.

REGENERATION SUCCESS: ARE THE TREES GROWING BACK?

Regeneration success is difficult to measure, even years following the harvest and natural or artificial regeneration of a particular stand. For one thing, MNR explained, "it is not really possible to project exactly what stand composition is expected to be found at, for example, year 2, year 5, year 15, year 25, etc." (MNR Response to Board Interrogatory #121). For another, it is not practical to do repetitive field studies of the same site to keep checking its progress. For these reasons, while MNR sometimes surveys the survival rate of plantations in their early years, the crucial measure of regeneration success comes about 10 years after harvest, when MNR determines whether a given stand can be declared "Free-to-Grow." As described more fully on p. 214, Free-to-Grow status is based on the height, and density of the target species and its relative freedom from competition. The count includes both plantation trees and "volunteers" of the same species which were not planted or seeded but which grew into the stand naturally. We were persuaded by MNR witnesses that stands declared Free-to-Grow can be expected to mature into productive components of the forest, barring natural catastrophe. Earlier measures of success or failure are useful for monitoring performance, but must be treated with caution.

In the following discussion, we describe our findings on the evidence of regeneration success in more detail, and give our reasons for ordering conditions regarding future measurement and reporting of renewal efforts and effectiveness.

The Regeneration Gap

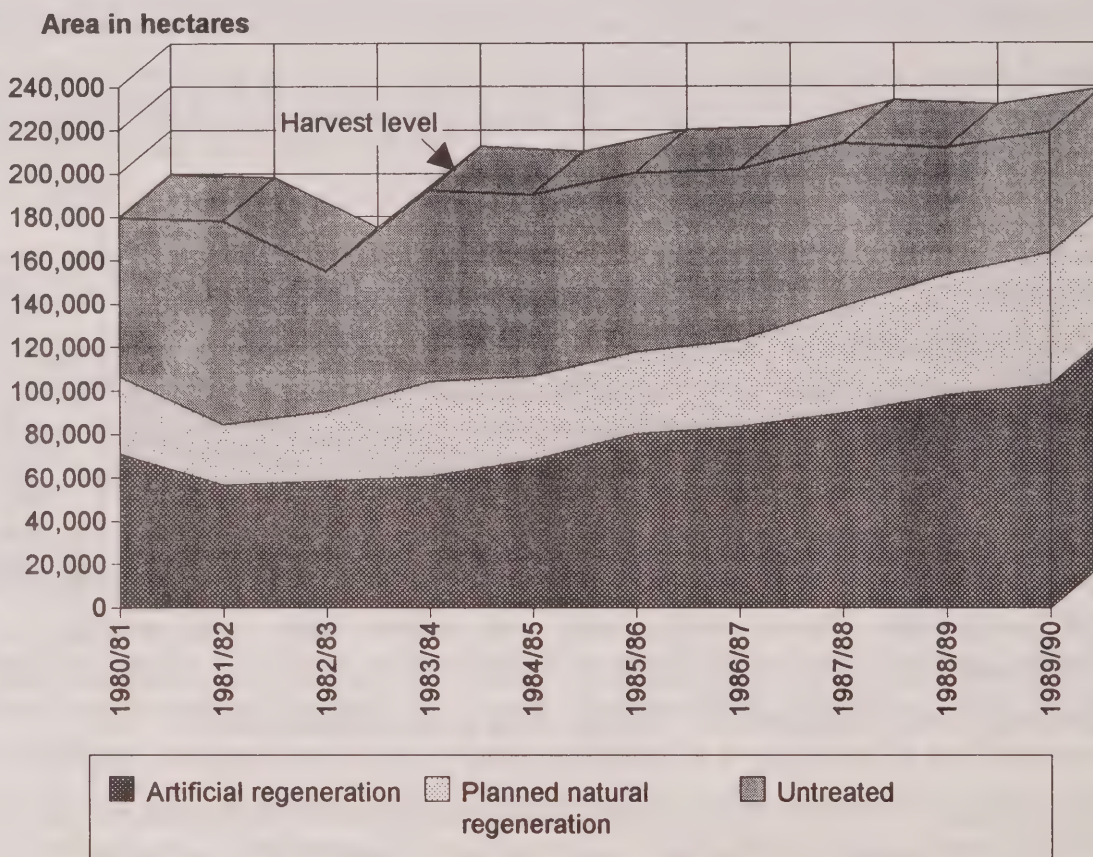
MNR statistics show substantially more land is logged every year in Ontario than is treated, either for artificial or natural regeneration. For example, Figure 6.3 shows in 1989/90 almost 220,000 hectares was harvested, while only 160,000 hectares was treated by artificial or planned natural regeneration methods. The untreated area was described at the hearing as a "regeneration gap," which can leave the mistaken impression that these untreated lands have been abandoned to permanent wasteland status.

We received extensive evidence about this issue, especially from forester Peter Hynard in MNR Panel 11, and we asked for clarifications and updated information in several of the Board Interrogatories before hearing Reply evidence. We found some confusing statistics and misleading jargon, such as the terms "unassisted renewal," "unplanned renewal" and "unreported renewal," all meaning roughly the "untreated" area in Figure 6.3. Eventually, it became clear to us that most or all of the land in the untreated "regeneration gap" is in fact regenerating naturally, although not always to commercially preferred species (see especially Mr. Hynard's evidence beginning at trans: vol. 97, p. 16297). The report of the Ontario Independent Forest Audit deals with related issues and provides its own recommendations to MNR. The report was issued after our hearing concluded and we do not base any of our findings on it. The report is available from MNR.

Some of the land which is harvested simply cannot be treated for regeneration. Mr. Hynard gave us statistics showing in the years 1982-86 an area ranging from 36,000 hectares to 56,000 hectares was untreatable each year because of physical barriers. For example, some areas are harvested using winter roads in areas where the ground is too wet, too rough or too rocky to return in summer for planting or seeding (trans: vol. 97, p. 16317). Other areas are non-treatable, Mr. Hynard explained, because too much residual timber has been left on the site, usually less commercially valuable species such as poplar and balsam fir. It is Mr. Hynard's opinion that the extent of non-treatable areas will diminish in the future because of the trend toward improved markets for hardwood pulp and poplar waferboard, new and improved silvicultural equipment and techniques such as disc trenchers and prescribed burning, the trend toward improved forest access and results of research into improved techniques for natural and artificial regeneration (Board Interrogatory 127).

In other cases, an area could be treated but isn't. Mr. Hynard's statistics showed this area ranging from 14,000 hectares to 44,000 hectares annually in the years 1982-86. Possible reasons for leaving them untreated, Mr. Hynard said, are "a scarcity of nursery stock or the dollars necessary to plant them, including the site preparation and tending costs." He said

Figure 6.3
Provincial Crown Land Regeneration and Harvest Levels
1980/81 - 1989/90



Source: Update of Exhibit 534C, MNR Question 35*

*Adjusted to show harvest in fiscal year of operations rather than in following year as reported by MNR

these were "sites which are in a treatable condition which require treatment in order to regenerate species that are commercially preferred, but which we are unable to treat for fiscal reasons." (trans: vol. 97, p. 16305)

If the statistics comparing harvest and regeneration do not tell the story, how can MNR expect the public to believe the forest is regenerating successfully?

MNR told us that for the purposes of planning a sustainable wood supply, the most important control on regeneration results is that no harvested area is counted or added back into the productive forest land base for the MAD calculation unless it has been assessed as Free-to-Grow, which is discussed below.

MNR knows a lot about regeneration results from its "condition" surveys such as second-year survival and NSR surveys, discussed below, and from its research programs and project records for all treatments. This information is generally kept at the district office.

MNR is taking steps to improve its information on regeneration results through the various new programs we discussed in Chapter 3: the Silvicultural Monitoring System called the STEMS project, and the Integrated Resources Inventory System known as INRIS. MNR will report to the public on regeneration success at the management unit level through annual reports for forest management units (Condition 79), the Report of Past Forest Operations (Condition 21), the MAD calculations (Condition 28) and Free-to-Grow (Condition 15), independent audits (Condition 86) and through the Local Citizens Committees whose members will gain a first hand understanding of regeneration success and costs. MNR will report provincial regeneration success through the provincial Annual Report on Timber Management to the Legislature (Condition 82) and the five-year State of the Forest Report (Condition 84). We are also requiring MNR to improve its assessment, recording and reporting of silvicultural effectiveness for natural and artificial renewal methods (Condition 96). Other aspects of silvicultural effectiveness reporting are discussed in Chapter 8.

The evidence that we found most convincing in demonstrating that regeneration is successful is discussed in the following.

Survival Surveys

"Survival" of planted trees is the ratio of living trees to the total number of trees actually planted. Data on the survival rates of planted trees are collected usually one or two years after planting and kept at the management unit. MNR Panel 4 presented summaries of second-year survival data taken from five management units in 1987 (Ex. 135, pp. 197-211) and for the province (Ex. 135, pp. 212-14). MNR witness Kenneth Armson presented the results, concluding that survival rates have improved significantly for black spruce regeneration over the three time periods studied. For example, black spruce second-year survival rates increased from 58% to 81% between 1963 and 1984 (trans: vol. 38, p. 6453 and c.f. Ex. 135, pp. 211-14). The authors of the summaries warned that the second-year survival survey is made too early in the life of the plantation to be a definitive measure of the success of the silvicultural treatment.

Witnesses for MNR and OFIA told us that second-year survival data do not indicate the overall amount of regeneration on a site or provide an indication of what the situation will

be at maturity, although they do indicate where further treatment is necessary (trans: vols. 159, pp. 27805-9 and vol. 199, pp. 35172-73). For these reasons we are not requiring MNR to do mandatory survival surveys, as proposed by FFT, on all regenerating areas. We are leaving it to MNR's judgement to do such surveys when necessary. An additional consideration is that companies in Forest Management Agreements have an incentive to monitor regeneration progress, because if the plantation has not achieved stocking objectives after five years they are obliged to re-treat at their own expense.

Stocking Standards

MNR witness David Gordon told us that MNR defines "stocking" as an expression of the amount of tree cover on an area that achieves a particular objective. Stocking surveys are usually conducted at the 5 to 7 year stage (Ex. 135, p. 31). MNR divides its plantations into plot sizes of four square metres. When a stocking survey is carried out for a given species, a Ministry field worker records whether at least one living tree of that species is present on each of the plots examined, giving a yes or no for each sample plot.

Groundrules in each FMA require the FMA holder to regenerate harvested areas to certain stocking standards. These stocking standards vary by FMA according to the forest unit, site characteristics, the chosen regeneration method and the regeneration objective. The stocking standards are usually expressed as percent stocking, which represents the percentage of four-square-metre quadrats within a sampling quadrat that has at least one acceptable tree seedling present. Industry witness Malcolm Squires presented the Industry's study on stocking standards (Ex. 1137, Appendix B). He explained that 100% stocking has no relevance to full stocking; it is just a statement that 100% of the sampled quadrats had acceptable seedlings.

Mr. Gordon explained that a stocking figure, on its own, is not a good indicator of regeneration success. The stocking data must be compared to the management objective for the given area, because optimum stocking of an area may require greater spacing distance. Ron Waito and David Gordon, MNR foresters, told us that the legal obligation for FMAs is 40% stocking, but stocking objectives can be higher. Mr. Hynard added that 40% stocking at five years will provide a fully stocked stand at maturity (trans: vol. 107, pp. 17931-2). If an FMA stand does not reach the desired stocking level by the fifth year, the company has to re-treat the area at its own expense. The Industry submits that stocking of 40% in regeneration stands can yield acceptable mature stand volumes.

The case studies presented by OFIA's Panel 4 demonstrated that, using artificial and natural renewal methods, renewal more than met the minimum stocking standards set out under the related FMAs. Case study 4A, for the jack pine upland cover type, showed that good success can be achieved with artificial regeneration. Industry witness Murray Ferguson testified that the fifth-year stocking assessment results showed combined conifer stocking of 50% (jack pine and black spruce) (Ex. 1100, Case Study 4A, p. 44).

FFT suggests there is no evidence that areas are regenerated to exceed the 40% minimum stocking standard (FFT Final Argument, p. 226). The OFIA case study results show otherwise: Case Study 4A achieved 50% stocking; Case 4B achieved 50% in the standard block and 81% in the experimental block; Case 4C achieved 63% stocking on 19 blocks previously designated as not satisfactorily regenerated (NSR) lands; and 4D achieved stocking of 51% to 65% conifer (Ex. 1100).

Free-to-Grow (FTG)

A forest stand is considered "Free-to-Grow" when it meets a minimum stocking standard and height requirement, and is essentially free from competing vegetation. Once an area is considered FTG, it is included in the land base for MAD calculations as we discuss in Chapter 5. The FTG concept was introduced in 1980 and became applicable to all management units in 1986. A set of benchmark FTG standards was prepared for each MNR Region (Ex. 135, pp. 177-93).

FTG surveys are requested by FMA holders, and undertaken by MNR at about year 10, when the trees measured have reached minimum height requirements (Ex. 135, p. 31). OFIA complained to us that MNR is too slow in doing FTG surveys and there is a backlog of regenerating areas ready to be assessed. It withdrew, however, a proposal that would have required MNR to meet deadlines for conducting FTG surveys.

In its response to Board Interrogatory 134, MNR said the resources dedicated to FTG surveys have increased significantly between 1986 and 1991. For example, in 1990-1991 FTG assessments were performed on 22 FMAs and 33 Crown and Company Management Units and of the 209,200 hectares assessed, 154,500 hectares were declared successfully regenerated by Free-to-Grow standards.

Not Satisfactorily Regenerated Surveys (NSR)

MNR points to its knowledge of the state of regeneration in the FMA areas as an indication that successful regeneration is being achieved. All management units that became FMAs were subject to NSR (not satisfactorily regenerated) surveys, whose purpose was to identify those areas previously depleted by harvest, pests, fire or blowdown and require the FMA holders to treat them within 20 years. The NSR surveys show that 4% of the FMA lands (i.e. 779,892 hectares out of 17.9 million) required treatment and 90.7% of these areas have already been treated (Response to Board Interrogatory 124).

Survey of Artificially Regenerated Sites (SOARS)

The beginning of significant artificial regeneration of our northern forests can be dated back to the 1960s. Thirty years later, we do not have the advantage of observing the outcome of planted or seeded forests that have reached mature rotation age. FFT contends that we have only two pieces of evidence on the results of long-term plantation management in Northern Ontario – MNR's SOARS I and II surveys and George Marek's experience – and both show that artificial regeneration has failed. We disagree.

The SOARS projects (Ex. 141 and Ex. 553) were ground surveys of regeneration success begun by MNR in 1984 and extended in 1986 to cover five northern regions. Their objective was to assess the success of areas planted and seeded in the 1960s and 1970s in meeting the Free-to-Grow (FTG) standards that allow regenerated areas to be included in the MAD land base.

MNR witness Ken Armson described for us the three conclusions MNR took from the SOARS data (trans: vol. 31, pp. 5132-33):

- (1) A diversity of tree species, including the three target conifer species that were planted and seeded, grew back on the cutovers.
- (2) Approximately 80% of the regenerating areas achieved the FTG objective for the three target species (i.e. jack pine, white spruce and black spruce).
- (3) Approximately 20% of the regenerating areas failed to meet the FTG standards for the three target tree species.

Mr. Armson agreed with FFT counsel Joseph Castrilli that the 20% of regenerating areas not meeting the FTG standards represent a silvicultural effectiveness failure to achieve MNR's objectives for the three conifer species on these sites. Mr. Armson went on to

explain that these areas cannot be seen as a regeneration failure because they might have achieved the FTG standards for other commercial tree species, none of which was included in the SOARS work except for the three target conifer species (trans: vol. 35, pp. 5797-98).

MNR and OFIA also raised questions about the relevance of the SOARS data for current regeneration success. We accept their opinion that the SOARS data are a measure only of silvicultural practices of the 1960s and the early 1970s, and contemporary regeneration methods are much improved. Scarification techniques are much more effective, better methods are used for transporting and storing the seedlings and tending efforts have increased (Ex. 553, p. 26).

We agree with the conclusions of Mr. Armson concerning the SOARS data: artificial treatments usually regenerate areas faster and give more control over species composition; it is a myth that there exists a "biological desert" of non-regenerating cutovers in our forest; but the forest grows back into many species, in addition to those we plant and seed (trans: vol. 31, pp. 5168-69). What we saw on our site visits supports what Mr. Armson told us.

We also disagree with FFT's submission that George Marek's experience in attempting to establish spruce plantations in the Lake Nipigon area demonstrates the failure of artificial regeneration. Mr. Marek used experimental techniques of intensive management which he acknowledges are not those generally practised in Ontario, and he set stocking standards for his monoculture spruce plantations roughly twice as high as the 40% standard that would be needed to produce a satisfactory yield. His inability to achieve such ambitious goals does not prove that artificial regeneration is a failure in Ontario generally. Mr. Marek also attempted to eradicate all competing species, and was dissatisfied that he was only able to suppress them temporarily. This temporary suppression, giving preferred species a chance to predominate in a stand, is MNR's policy as described in the evidence at this hearing. Thus Mr. Marek's experiment, though considered a failure in his terms, might well be a success in the real world of Ontario forestry (trans: vol. 259, pp. 46588-652).

Differences in Regeneration Success between Artificial and Natural Methods

OFIA gave us statistics on the regeneration success experienced by 16 FMAs using contemporary regenerating techniques. OFIA presented a summary of these fifth-year stocking assessment results to the end of 1988 (Ex. 1137, p. 124). The measure of success was for these areas to achieve the minimum stocking standards dictated in the FMA Groundrules. We agree with OFIA that the results are impressive: 96% of the area treated

with artificial regeneration methods met stocking standards for all working groups compared to 71% with natural regeneration methods. The results for softwoods only are even more dramatic – 96% for artificial regeneration and 63% for natural regeneration.

We agree with the conclusions that OFIA draws from these results:

1. The overall proportion of treated area meeting or exceeding minimum standards, for all working groups and all renewal methods, averaged 80%.
2. Artificial regeneration, overall, was significantly more successful than natural regeneration.
3. Natural regeneration is a viable technique for the regeneration of hardwoods and mixed woods.
4. Over-dependence or exclusive reliance on natural regeneration methods would materially reduce the level of regeneration achievement in the area of the undertaking and negatively impact the ability of professional managers to provide future wood supply.

These conclusions are also consistent with the results of the costing exercise we ordered (Ex. 2226).

Examples of Successful Regeneration of Large Clearcuts

One of the most dramatic examples of the regeneration that occurs after clearcutting is found in the areas which Robinson and Flowers, in their 1976 paper on a "Proposed Policy for Controlling the Size of Clearcuts in Northern Forest Regions of Ontario" (Ex. 157) cited as evidence of the negative effects of large clearcuts. OFIA submitted 1989 photographs (Ex. 1152 A, B, and C) of one of the areas (Dog River/Mattawin), a 968-hectare clearcut which was regenerated through a combination of natural treatments following mechanical site preparation, as well as artificial regeneration by direct seeding. The photos demonstrate that, only 14 years after harvest, the area had regenerated to a healthy and vibrant jack pine forest. Jack pine regeneration achieved 40% to 60% stocking and was approximately 10 metres in height. The minimum stocking level for most FMAs is 40% (trans: vol. 199, pp. 35203-9).

We also found the presentation (Ex. 181) by John Cary, Senior Project Advisor, Planning & Environmental Assessment Branch, MNR, to be convincing evidence that the forest grows back after harvest, even without artificial regeneration and tending, although possibly to less desired species. In 1976, as Management Forester for Dryden, Mr. Cary wrote an article

predicting that large areas of the province's forests that had been clearcut would go out of production (Ex. 158). His pessimistic prediction was based on stocking surveys done in 1973, 1974 and 1975 and the level of forest management activity at that time. He was concerned about budgeting, staffing and technology limitations, especially site preparation. His 1976 article warned of the consequences of failed regeneration, caused by "uncontrolled cutting" and a lack of manpower for mechanical site preparation.

In 1987 Mr. Cary revisited the areas he had managed in the period of 1973 to 1976 and on which he had based his 1976 article. What he found was that his predictions for large clearcuts had been wrong. By comparing Forest Resource Inventory maps for 1965 and 1985, Mr. Cary discovered that the amount of forest considered barren and scattered had decreased from 22% in the 1960s to 6% in the late 1980s. Aerial photographs of the area south of Niven Bay from 1965, 1969 and 1982 show that the new forest that has grown back on the areas cut in 1968 looks very much like the pre-harvest 1965 forest (Ex. 186A-C). Mr. Cary also presented aerial photographs of an area south of Kekekwa Lake taken in 1965, 1969, 1976 and 1982 (Ex. 188A-D), which showed that the signs of the harvest of 1967 had almost disappeared by 1982. While the new forests look like pre-harvest forests, many have changed working groups, for instance one stand went from 50% jack pine to 20% jack pine, and is now primarily poplar (Ex. 187B, trans: vol. 38, p. 6353). Mr. Cary explained that this is considered regeneration success but not silvicultural success "and we are not happy with that, we are simply not happy" (trans: vol. 38, p. 6356). He added that stand compositions change over time, and the proportion of desired species may well increase in the next 20 years. Meanwhile, greater use is being made of poplar. Overall, our conclusion is that the forest will grow back on large or small clearcuts, but in many circumstances only artificial regeneration will assure a predominance of preferred species in the new stands.

Experience of Witnesses

We agree with OFIA's observation that the experience of their renewal experts is impressive: four of the six industry witnesses had over 25 years of experience, much of it on-site at the same location. Their evidence is credible with respect to past renewal activities to planning prescriptions for future site-specific renewal activities. MNR's five renewal witnesses also have extensive experience in regeneration activities, and all possess over 15 years experience as professional foresters in Ontario.

In comparison, FFT's three witnesses on renewal were limited in experience and familiarity with renewal activities throughout the area of the undertaking. Mr. Marek, the most

experienced of the three, made clear his expertise covered only black spruce in the Nipigon area where he has done his work.

We accept the testimony of OFIA and MNR renewal experts that artificial regeneration is required on certain sites to regenerate conifer and that successful regeneration is being accomplished using both artificial and natural methods.

Evidence of Regeneration Failure

We are satisfied that the timber management planning process we are approving is capable of giving warning that regeneration efforts are in trouble and of providing information on regeneration failures (Response to Board Interrogatory 125).

The Forest Resource Inventory (FRI) takes aerial photographs of every management unit about every 20 years and shows "barren and scattered" areas that contain no significant amount of regeneration to commercial species, although MNR contends that it underestimates small conifer regeneration that may hide under other vegetation. If the provincial "barren and scattered" category increases significantly over time, this would signal a problem with regeneration.

Since 1985, MNR has recorded annual depletions of the forest by logging, insects, fire and disease, and matched these against accruals by stands meeting free-to-grow standards. Our Condition 21 and Appendix 8 require the continuation of this procedure for each Plan and our Appendix 22, section 1(e) requires an estimate of the change in the province's growing stock. If the depleted areas significantly outpace the areas declared regenerated, this would be another indication that we are failing to meet regeneration objectives.

The various reports we require in our Conditions of Approval, which we describe in Chapter 3, will also identify significant problems with regeneration. The Report of Past Forest Operations in each Plan (Condition 21, Appendix 8) will review a failure to meet regeneration objectives in the previous five year Plan. The Provincial Annual Report on Timber Management (Condition 82, Appendix 20) will summarize Ontario's land and forest base, areas declared free-to-grow and condition survey results. The five-year State of the Forest Report (Condition 84 and Appendix 22) will analyze silvicultural effectiveness, the forest growing stock and anticipated problems and issues.

We discuss other aspects of silvicultural effectiveness and the monitoring of timber and non-timber resources in Chapter 8.

INTERVENORS' PROPOSALS

FFT's Preference for Natural Regeneration

FFT failed to convince us that natural regeneration can work successfully to replace some or most of the artificial regeneration treatments used today.

FFT proposed that foresters be required to use natural regeneration unless it can be demonstrated that it will fail. We are convinced by MNR's argument that experimenting with natural regeneration is unnecessary on sites where past experience and the Silvicultural Guides indicate that artificial regeneration is more effective (Response to Board Interrogatory 142). Waiting for natural regeneration to be successful or determining the point at which it has failed in these situations would only delay regeneration after harvest and take longer for the areas to be added back into the productive forest land base.

Under FFT's proposal, artificial regeneration treatments could only be used where they show a positive net present value (NPV). In Chapter 5, p. 199, we reject using this standard financial valuation technique, which will almost always give a negative NPV for Ontario's silvicultural investments. Net present value is not supportable as the only basis for making decisions about investing in forest regeneration because it does not fully measure the economic and social benefits received by the public from forestry.

FFT submitted that natural regeneration is less costly than artificial methods. The results of a cost comparison exercise discussed on p. 191 of Chapter 5 suggest that one of FFT's proposals for modified cutting and more natural regeneration could be less expensive than MNR's present practice, but the result could be a future shortage of conifer wood supply.

The proposal from FFT for greater reliance on natural regeneration ignores the reality, as MNR puts it, that "natural regeneration is not a panacea and cannot be relied upon for all purposes" (Response to Board Interrogatory 142). Even FFT's own witness, Crandall Benson admits that "we have a lot to learn in the area of natural regeneration" (trans: vol. 280, p. 50204). MNR acknowledges that over the last 20 years it has placed a high priority on developing and improving artificial regeneration and now needs to improve its information base on natural regeneration. Some of this work is being done through the Sustainable Forestry Initiatives program, for example a five-year project on enhanced natural regeneration methods (Response to Board Interrogatory 141). MNR told us that they have a good deal of success with natural regeneration when the sites and species are carefully selected, but that there will always be a need for an artificial regeneration program.

We are persuaded by MNR's view that a "shift to natural regeneration would cause unacceptable effects on forest structure and future wood volumes" (Response to Board Interrogatory 142). This evidence is discussed on pp 195 of Chapter 5 with the results of a wood supply analysis showing that FFT's natural regeneration alternative could result in 12% to 17% less conifer content in our regenerating forest. This evidence was supported by OFIA witness Mac Squires, a forester with expertise in black spruce regeneration, who submitted that longer rotations dependent on slower natural regeneration would be a factor contributing to wood supply shortages of critical tree species.

FFT failed to demonstrate to us that artificial regeneration is unsuccessful. The evidence on regeneration success is discussed above (pp. 209). We believe the results of the fifth-year stocking assessments for FMAs is particularly relevant to this question and these data show that the percentage of areas meeting minimum stocking standards for softwood was much higher at 96% by artificial regeneration compared with 63% for natural regeneration (Ex. 1137, p. 124).

We conclude that artificial treatments are essential for regenerating conifer species on certain sites. The purpose of MNR's undertaking to supply timber to the forest industry cannot be achieved, in our opinion, without the use of both artificial and natural regeneration methods.

Proposals on Tree Nurseries and Planting

The Ontario Public Service Employees Union (OPSEU) asked us to order MNR to reverse its decision to stop producing bareroot stock at four tree nurseries, a decision taken as part of the ministry's province-wide cutback of bareroot production. The union also wants us to force MNR to fund regeneration of conifer forests in all areas, including a backlog of past cutovers declared Not Satisfactorily Regenerated. OPSEU also recommended that tree planting be returned to the exclusive jurisdiction of MNR. If private tree planters are allowed to continue, OPSEU submitted that there must be minimum requirements to conform to all labour, health and safety legislation and private contractors must conduct survivability tests of planted seedlings as required by MNR (Ex. 2225).

Two kinds of stock are used in replanting Ontario forests — bareroot and container. Bareroot stock is larger and more robust, but may require up to four years to produce. Most come from MNR nurseries, currently 45 million per year. Container seedlings are smaller, cheaper, and can be produced in as little as 14 weeks. Most container stock is grown by private nurseries. On some sites where heavy competition is expected, only

bareroot stock is likely to be successful. But on other sites good results have been achieved with container stock. MNR told us that there will always be a use for both kinds, but that a trend toward more use of container stock is expected to continue. OPSEU argued that this is only because of MNR's inadequate funding. We are not persuaded by the evidence that MNR's closure of the bareroot nurseries will adversely affect regeneration success. A provincial summary of second-year survival results shows success rates of 80% to 92% for both bareroot and container stock, and we believe MNR must balance what it expects to be the demands for both kinds of stock.

Because of funding restraints, MNR imposed a province-wide "cap" on nursery stock production of 160 million seedlings per year in 1987, later increased to 162 million seedlings annually (trans: vol. 159, pp. 27847-49). We heard conflicting submissions about the size of the shortfall between the number of seedlings to be produced under the cap and the actual demand for nursery stock. We agree with the concern of OPSEU and OFIA that nursery stock production is being set by MNR at an arbitrary level dependent on financial constraints and perhaps unrelated to the biological need of the forest. We accept OFIA's argument that a new Timber Production Policy should lead to rational setting of nursery stock production levels and the necessary government funding. Our Condition 105 on this subject is discussed on p. 377 of Chapter 11.

MNR turned most of the tree planting business over to private contractors in the mid-1980s and we understand that the great majority of tree planting is now done by contractors rather than MNR employees (Ex. 532A, p. 185; Ex. 2225, p. 12). We were told that approximately 78 private contractors were operating in northern Ontario in 1991 and 30 of these are members of the Ontario Silvicultural Contractors Association (trans: vol. 205, p. 36572).

The tree planting season is a short period of six to eight weeks annually. Grant Brodeur, a private contractor, described the hard physical work for which planters are paid 6¢ to 15¢ per tree to do under difficult conditions in the bush:

... we are now planting 162 million trees in 1990 at about 2,000 trees per hectare on average, that's about 80,000 hectares of land that are going to be hand planted by planters. That means that every six feet there is some guy that is going to be bending over and sticking his hand into the cold, wet dirt and planting a tree. That's a lot of bending over if you have to do deep knee bends 162 million times.

(trans: vol. 205, p. 36580)

The complaints we heard most often were that trees are being planted improperly by untrained, inexperienced students and the private contractors exploit student labour at the expense of jobs for northern residents.

The evidence we received suggests to us that there is considerable supervision and monitoring of tree planting as provided for in contracts. On FMAs, the forest industry monitors planting quality and handling carefully because the companies have to pay for retreating planting failures. An example of this is E.B. Eddy, which plants 90% container stock, and employs its own tree planting foreman who is supervised by a control assessor (trans: vol. 198). Abitibi Price conducts a one-week training program for tree planters who are tested and hired only if they plant 85% of seedlings acceptably (trans: vol. 199, pp. 35120-21). We were told that in other contracts, 95% is the minimum acceptable quality and below 85%, the contractor is not paid and is charged for damages (trans: vol. 205, pp. 36599-601).

On the issue of employing local residents, Bill Skene, a planting contractor, told us that most of his employees are university students and he cannot hire local residents because they will not live in bush camps (trans: vol. 311, p. 55122). Herb Martin, another planting contractor, described the problem being that "with only six weeks work available many local people are not interested in working in the tree planting field, which is understandable, it is not a career move and ... so it's primarily university students from southern Ontario and other provinces that do the bulk of the work" (trans: vol. 311, p. 55161). We are concerned that low wages and unpleasant working conditions may be serving simply as an excuse for this lack of opportunity for northern residents.

We were asked to consider setting fixed "quotas" of local residents required to be hired by tree planting contractors. We understand the frustration of northerners who see tree planting operations owned by and employing outsiders who appear to be taking money from the local economy and giving nothing back. We were told by native communities that they are experienced tree planters and they want more planting jobs. We are ordering MNR in Condition 75 to require tree planting contractors to advertise and offer jobs first to northern residents, particularly natives and students, before hiring outside northern Ontario. This way local people will benefit more directly from the government's investment in tree planting. MNR may choose to use its funding of and contracts with the forest industry and tree planters to implement this policy. This condition does not preclude contractors from hiring outside Northern Ontario, for example, where they are unable to obtain suitable candidates, but it does give local residents an opportunity to be considered.

Similar Renewal Standards for All Management Units

OFIA is concerned that MNR is investing less in regeneration and monitoring of renewal on Crown management units compared to forest management agreement (FMA) areas.

One of MNR's major purposes in instituting FMAs in 1980 was to make the planning and carrying out of harvest and regeneration the responsibility of the forest companies. MNR's reason for paying fixed rates for regeneration work done by the FMA companies is that "regeneration is a long term investment. For this reason it may be true that private entities, particularly those without assured long-term land tenure may not have a high incentive to take actions today which may benefit someone else in the far distant future" (Board Interrogatory 120). One of the short-term incentives to encourage FMA companies to regenerate expeditiously is that harvested areas can be returned to the productive forest inventory once they are declared free-to-grow and this increases the size of future harvest areas calculated by the maximum allowable depletion (MAD). MNR also pays for regeneration treatments on Crown and Company Management Units through regeneration contracts that provide fixed rates for this work.

MNR told us that 58% of the harvest in the area of the undertaking was in FMA units in 1989, up from 10% in 1980 (Response to Board Interrogatory 132). Similarly, 64% of all regeneration treatments were in FMAs in 1989, up from just 2% in 1980. This trend is explained by the fact that as more FMAs were signed, more timber harvest and, therefore, more regeneration occurred on these lands. An additional factor is that FMAs are located in the northern boreal forest where even-aged management occurs. This explains high levels of artificial regeneration treatments for conifer species. One large Crown Management Unit and many Company Management Units are in the Great Lakes-St. Lawrence forest where uneven-aged management rarely requires tree planting or seeding.

MNR agrees with OFIA that regeneration on all three types of management units is equally important from the perspective of timber management and for short and long-term wood supply for industry. MNR explained to us that Crown management units provide significant volumes to industry. This wood is often less expensive because Crown units tend to be near population centres and the mills. Crown unit wood is also relied on to a high degree by small operators in the district cutting licence program (Response to Board Interrogatory 133).

We are satisfied that the conditions of our approval concerning silvicultural ground rules (Conditions 25 and 26), selection of areas for renewal operations (Condition 35) and

monitoring and reporting (Conditions 55 and 78 to 84) do not distinguish among management unit types with respect to renewal efforts.

We accept OFIA's argument that independent operational audits whose purpose is to assess compliance with the timber management planning process should apply to Crown and Company Management Units as well as to the FMAs. We order this in Condition 86, which we discuss fully in Chapter 8.

WHAT IS ONTARIO'S COMMITMENT TO REGENERATION?

MNR convinced us that some level of artificial and assisted natural regeneration treatments is essential to renewing the forest following timber harvest especially for the conifer species of spruce and jack pine. We are concerned, however, that government spending on renewal is declining: from \$45.6 million in 1990-91 to \$39.7 million in 1991-92 to a projected \$33.4 million in 1992-93 (updated MNR statistics, from Frank Kennedy, October 6, 1992).

OFIA's evidence is that MNR's recent cutbacks on regeneration spending are beginning to be seen in the forest: "because of the reduced total funding in 1992/93, some programs had to be cut back and site preparation was hardest hit, i.e., from an allocation of 60,189 hectares in 1991/92 to only 33,037 hectares in 1992/93. With this significant reduction and site preparation in 1992/93, 1993/94 planting and seeding programs will be reduced proportionately" (OFIA response to Board Interrogatory 4, April 15, 1992). When the OFIA renewal witnesses gave us their evidence in the spring of 1990 they indicated that MNR would be cutting back funding in some areas for silvicultural treatments. OFIA summarized the results for us in their argument:

While cutbacks were not experienced by all FMA holders in all areas, the cutbacks in fact experienced represented a significant reduction in silvicultural treatments including, for example, a 22% reduction in proposed mechanical site-preparation, a 16% reduction in proposed chemical site-preparation, a 20% reduction in proposed seeding, a 13% reduction in proposed aerial tending and a 6% reduction in proposed planting for 27 FMAs in the 1989-90 planning year.

(OFIA Argument, p. 42)

We agree with OFIA that funding constraints have an immediate impact and a continuing adverse effect in succeeding years on renewal targets.

We asked OFIA what FMA companies would do if regeneration funding from MNR were eliminated. The response was that it would be speculative to predict what would happen

but "each company would no doubt rationalize its own situation and, considering the prevailing economic climate, develop its own position" (Response to Board Interrogatory 4). MNR's response to the same question was that they anticipate that the larger forest companies would continue to do silviculture at some level but it would be difficult for individual small operators on Crown management units because of cash flow problems (Board Interrogatory 120). The evidence from OFIA is that the Ontario forest industry spent out of its own pocket \$4.5 million in 1983-84 and \$5.7 million in 1985-86 on silviculture.

MNR and the provincial Cabinet determine the amount of money to be spent each year on renewing the forest. At some point, declining investment in regenerating cutovers, particularly the conifer species, would threaten future timber supply. This approval is not the forum for setting future spending levels. We could not approve the Class EA if we had been told that significantly less or no effort would be made to regenerate harvest areas, but this is not the evidence we received. MNR told us repeatedly that artificial and planned natural regeneration treatments are essential to the renewal program, that regenerating the forest is expensive and that regeneration is one of the most important means of mitigating the adverse environmental impacts associated with logging.

We are ordering two conditions in our approval to address the concerns expressed by the public and the forest industry about the uncertainty of long-term funding for forest renewal. The industry's position and the evidence before us is that reductions in artificial regeneration treatments will adversely impact wood supply because regeneration of important conifer species such as spruce and jack pine on certain sites requires planting, seeding and tending. The submissions we received at the community hearings clearly demonstrated that the public supports MNR's regeneration program and wants even more effort devoted to renewing the forest following timber harvest. Northerners in particular complained to us that the Ontario government and the industry profit from forestry and by comparison too little of this revenue is spent on regeneration.

Although we find in Chapter 5 that the 1972 Forest Production Policy needs to be replaced with a new one reflecting today's circumstances, the evidence before us is that silvicultural efforts were increased in the years 1972 to 1980 (Ex. 136) and further escalated with the introduction of the FMA program in 1980. We are persuaded that a new Timber Production Policy is the best forum for determining the appropriate level of required silvicultural activity in the area of the undertaking and we order this work to be done in Condition 105. This issue is discussed more fully in Chapter 11, p. 377.

In addition to establishing provincial objectives for renewal, we are concerned about the potential for problems in individual management units when, following the harvesting of the timber, there is no money for the renewal treatments.

In situations where natural regeneration is identified as an appropriate silvicultural prescription, this presents no problem. In other situations where, in the forester's judgement, the silvicultural prescriptions require artificial or planned natural regeneration treatments, we believe that leaving the cutover untreated could have adverse effects. We considered ways of dealing with this problem.

The Coalition proposed a solution in the form of a forest renewal trust fund into which would be deposited 10% of the net value of the standing timber harvested. This money would remain in the fund until the stand is harvested in the next rotation and at that time the money would be spent on forest renewal or to enhance non-timber benefits. To us, waiting 80 to 100 years is too long to correct renewal failures. Mr. Bruno Seppala described for us timber agreements in Manitoba where the company pays a forest renewal charge based on the amount of wood produced, indexed to the sale price of the product and adjusted at five-year intervals (trans: vol. 204, p. 36248). This fund is used to pay the company to do forest renewal work. According to Mr. Seppala, there was a problem in one case where the forest renewal funds were paid into the general revenues of the provincial government and subsequently there was difficulty in getting Manitoba to release the money for the company's renewal work. This is a complaint we also heard in Ontario, that revenues from forestry are not earmarked for reinvestment in the forests but contribute to overall provincial expenditures. Mr. Seppala told us this problem was avoided in a second Manitoba Timber Agreement where the forest company deposited its renewal payments into a trust fund. We do not believe, however, that attempting to bind future Legislatures or Finance Ministers by earmarking government revenues is a sound policy.

We heard submissions from the public to the effect that the forest industry should be paying a greater share of the cost of regeneration, perhaps through increased stumpage fees. MNR's position has been that as the owner of the land, the Crown has a responsibility to pay for regeneration work and this is an incentive for the forest industry to make long-term investments and to operate in Northern Ontario. We note, however, that MNR is reviewing its stumpage rates as part of a broader analysis of the financial value of Ontario's forest resource (Ex. 2309, MNR Reply 4 Witness Statement, pp. 33-34). It is MNR's position that regardless of "who pays" it has designed a timber management planning process that is able to respond to changing circumstances; MNR will not approve Plans unless they contain the required silvicultural groundrules and appropriate planned renewal efforts (Response to Board Interrogatory 120).

We conclude that forest managers should know before harvesting that money will be available to carry out the silvicultural operations they prescribe. We do not believe we can require guaranteed funding five years into the future, but we also cannot afford to have the good planning of foresters just fade away if money fails to materialize. Therefore we are requiring in Condition 38(a) that each Plan include the forester's estimate of how much needs to be spent on regeneration. Then the Report on Past Forest Operations (Appendix 8, section 1(a)(iv)) and the five-year State of the Forest Report (Appendix 22, section 1(k)) shall report the amount actually spent compared with the original estimate. These provisions, combined with the province-wide regeneration target to be included in the new Timber Production Policy (Condition 105) should ensure as far as is possible that renewal activities are maintained at an acceptable level.

CHAPTER 7

MAINTENANCE OF THE FOREST: TENDING AND PROTECTION

INTRODUCTION

Two broad families of pesticides are used in Ontario forests: herbicides to control competing vegetation on planted or seeded sites and insecticides to counteract insect infestations.

Aerial spraying of chemical pesticides, with its potential adverse impacts on public health and the forest environment, alarms the public. Chemical pesticides used for forestry are authorized and regulated by various federal government departments including Agriculture Canada and Health and Welfare Canada. Chemical pesticides cannot be sprayed for forestry purposes in the area of the undertaking without the approval of the Ministry of Environment and Energy as required under the *Pesticides Act*.

MNR uses two chemical herbicides for aerial spray projects, 2,4-D and glyphosate. A total of 61,450 hectares was treated with these herbicides in 1991/92.

Chemical insecticides have not been aerially sprayed on northern Ontario forests since 1985. Instead MNR has relied on a biological agent known as B.t. (*Bacillus thuringiensis*). Because insect spray occurs only where and when required, the amount of forest sprayed in any year could vary from hundreds of thousands of hectares to only a few thousand hectares.

Different positions were taken by the parties on the use of chemical pesticides. FFT argued that chemical herbicides should be sprayed aerially only as a last resort, that use of 2,4-D should be banned permanently as soon as possible and that chemical insecticides should not be used under any circumstances. MNR argued that chemical herbicides are an essential tending method, but said the need for chemical insecticides must be evaluated and non-chemical alternatives used where possible. The forest industry believes chemical pesticides should be employed wherever warranted, unless their use can be demonstrated to be dangerous.

In this chapter we examine the regulation and use of pesticides, aerial spray operations, the need and effectiveness of herbicides and insecticides and what is known about their possible effects on human health and the environment.

Chemical herbicides are an important tending method, but we think MNR should search for alternative vegetation management techniques. The aerial spraying of B.t. has proven to be a satisfactory means of addressing insect infestations for the past eight years and we support the continuing practice of spraying B.t. only. In the event of an extraordinary situation where no alternative to chemical insecticides can be found, our Conditions of Approval require a detailed planning process and public scrutiny of any proposal to conduct aerial spray of chemical insecticides authorized for safe use in forestry.

THE APPROVAL AND REGULATION OF PESTICIDES FOR FORESTRY

Federal Government

Dr. Leonard Ritter, chief of the pesticides division of the Environmental Health Directorate at Health and Welfare Canada and witness for MNR, testified on the federal government's regulation of pesticides under the *Pest Control Products Act*, which is administered by the Department of Agriculture. The Act is designed to ensure that no person shall store, display, distribute or use a pesticide under conditions that are unsafe to human or animal health, or that will adversely affect the environment. The federal review and approval process requires evaluation of information on efficacy, toxicity and environmental effects, and allows for periodic re-evaluation of registered products. The evaluation process includes reviews by the Environmental Health and Food Directorates of Health and Welfare Canada, the Canadian Wildlife Service and Environmental Protection Services of Environment Canada, Fisheries and Oceans Canada, and for registration for forestry purposes, the Forest Pest Management Institute of the Canadian Forest Service (Ex. 603A, pp. 85-90).

Under the *Pest Control Products Act* regulations, products are labelled according to classifications. Products registered for forestry use have historically been classified as "Restricted." The Restricted classification reflects a special concern for human health or the safety of plants, animals or the environment in light of the intended use of the product and its inherent characteristics. "This designation reflects the historical perception that ... forestry environments, being in a 'natural' state, are more environmentally sensitive, and thus warrant particular care and attention" (Ex. 603A, p. 96).

The curious situation of what appears to us to be strict regulation of forestry pesticides and little if any regulation of the same products for other uses was also underscored by Dr. Ritter's comments about the perception of hazard in using chemical insecticides:

That automatic designation in forestry is true only for forestry. The very same product may often be used in a domestic setting and the product can be bought at Canadian Tire – if we talk about malathion or some of the other insecticides – you can buy that very same product at Canadian Tire in a totally unrestricted way, but if you buy it for application to a forest in Ontario, or indeed anywhere in Canada for that matter, there will be numerous levels of control which will be imposed on that application.

(trans. vol. 132, p. 22485)

Dr. Ritter told us of releasing a warning in 1986 about a possible association of 2,4-D (sprayed as a forestry herbicide) with cancer because of preliminary epidemiological investigations on the exposure of agricultural workers, known as the Kansas Study. Dr. Ritter testified that the following year he decided, after further evaluation, that there was no cancer risk. He said he makes no apologies for what he believed was a prudent action at the time. We see this incident as an example of the regulatory process working successfully with respect to early warnings from scientific research.

Dr. Ritter's conclusion was if the federal Departments changed their views on the safety of using forestry pesticides, the Department of Health and Welfare would have to recommend that the Department of Agriculture remove the authorized registration of these chemicals to prevent their use in forestry. This has not occurred and we have no evidence of any plans by Health and Welfare Canada to do so.

Ontario Government

The *Pesticides Act* is administered by the Ontario Ministry of Environment and Energy. The provincial legislation is complementary to that of the federal government, and provides a system of permits and licences, and schedules of products which can be used in Ontario for specific purposes. Individuals who apply these products in forestry are licensed, and each aerial application requires a permit from the Ministry of Environment and Energy (Ex. 603A, pp. 98-106). MOEE did not submit any evidence or call witnesses to testify on the use of pesticides in forestry and did not propose to us any restrictions on the use of forestry pesticides in Ontario.

The United States Environmental Protection Agency

Dr. Joseph Rodricks and Dr. Nancy Rachman, of the Environ Corporation, Arlington, Va., witnesses for the forest industry, described the stringent U.S. Environmental Protection Agency process for authorization of pesticides used in forestry.

They said all of the herbicides registered and authorized for use in forestry in Ontario are currently registered for forestry use in the United States.

Of the chemical insecticides registered and authorized for use in forestry in Ontario, carbaryl and fenitrothion are currently registered for forestry use in the United States while aminocarb is no longer registered for any uses in the United States (Ex. 1239, p. 20). Dr. Rodricks and Dr. Rachman also confirmed that the EPA:

... has not identified any risks with respect to forestry use in the United States of the chemical pesticides approved for forestry use in Ontario, and has not imposed, with respect to these pesticides, any form of risk mitigation requirement related to human health risks from forestry uses.

(Ex. 1239, p. iv)

Dr. Ritter described a Memorandum of Agreement between the EPA Office of Pesticide Programs and the Canada Department of National Health and Welfare (Health Protection Branch) (Ex. 772), allowing them to share technical data and information on ingredients found in pesticide formulations regulated by both countries.

International Regulation

Canada and the United States are members of several international organizations involved in establishing registration requirements and testing guidelines for pesticides: the European Community; the Council of Europe; the Organization for Economic Cooperation and Development; and the Codex Committee on Pesticide Residues, which operates under the United Nations Food and Agriculture Organization and the World Health Organization (Ex. 604A, pp. 84-85). Dr. Ritter told us that these forums provide for an international discussion and exchange of information. He said that there is a tripartite commission among Canada, the United States and the United Kingdom for the purpose of harmonizing pesticides regulations (trans: vol. 125, p. 21012).

Findings

We have no evidence to contradict the view of the federal government departments of Agriculture and Health and Welfare, which are charged with the legal responsibility to regulate the use of pesticides, that these products are authorized for forestry purposes based on detailed consideration of their actual and potential effects on human health and the environment.

TENDING

Introduction

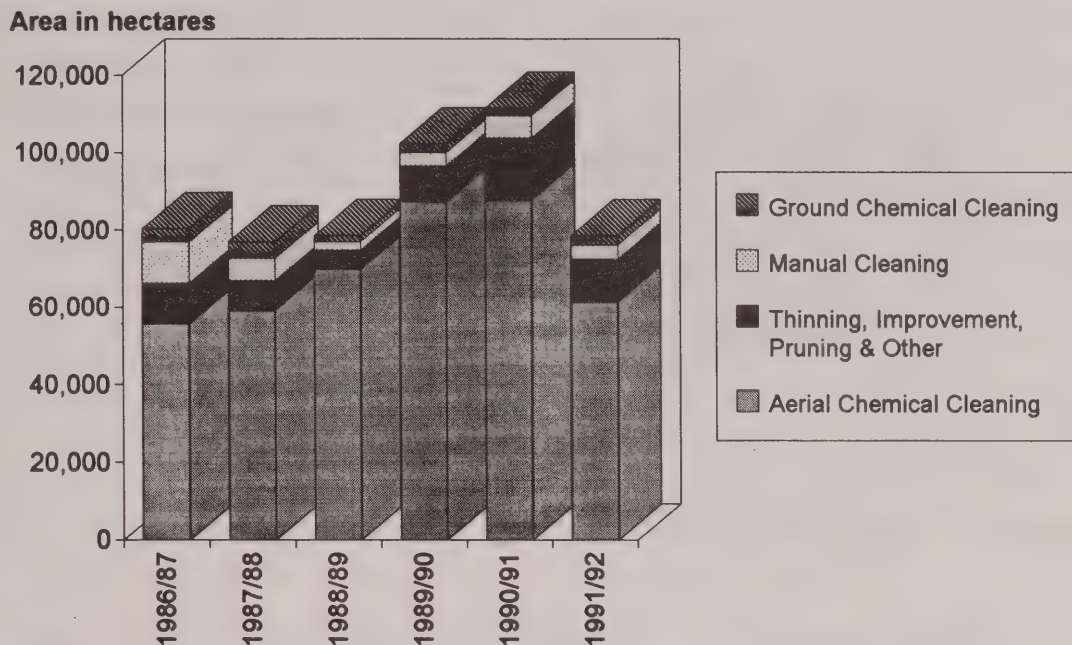
Herbicides are used during site preparation and tending. Treatments carried out to control competing vegetation before the stand has been regenerated are known as site preparation. We discussed the activity of site preparation as part of renewal on p. 204 in Chapter 6. Site preparation accounted for 12% of the total area treated with herbicides in Ontario for forestry in 1990/91 (Update of Ex. 603A, p. 228; MNR Question 37, p. 3).

Silvicultural operations conducted during the period after harvest are known as "tending" treatments. Herbicides can be used in tending treatments to control competing vegetation following planting and seeding and also to thin growing stands. Tending treatments accounted for 88% of the total area treated with herbicides in Ontario for forestry in 1991 (Update of Ex. 603A, p. 228; MNR Question 37, p. 3).

"Cleaning" or "release" treatments are tending operations carried out to kill vegetation competing against very young even-aged stands regeneration from planting or seeding. The three options for release or cleaning treatments are aerial chemical cleaning, ground chemical cleaning and manual cleaning. In Ontario, the most common tending treatment is aerial spraying to release young conifer stands from competing hardwoods and broad-leaved plants (Ex. 604A, pp. 119-120).

A summary of tending treatments carried out on Crown lands in Ontario, 1986/87 to 1991/92 is provided in Figure 7.1. It shows that aerial chemical cleaning treatments made up 80% of all tending treatments carried out in the area of the undertaking during those years. It also demonstrates that manual cleaning has decreased substantially since 1986 while chemical cleaning has increased slightly.

Figure 7.1
Tending Treatments on Crown Land in the
Area of the Undertaking, 1986/87 - 1991/92
Area Treated by each Tending Method



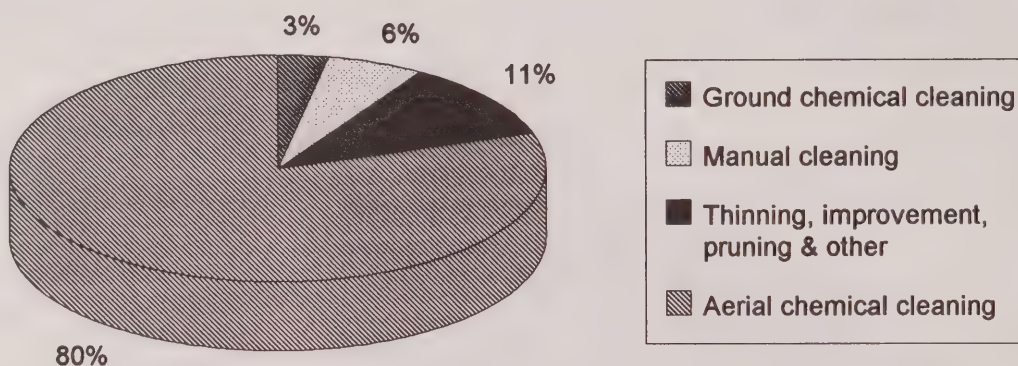
Source: Update of Ex. 603A, p. 118, MNR Question 36

Other tending treatments include thinning, pruning, improvement cutting, salvage cutting, and other intermediate cuts. These treatments are carried out later than cleaning, in order to thin stands, remove defective trees, salvage merchantable timber or to improve lumber grade of the final harvest (Ex. 604A, pp. 121-131). Most of these other tending treatments are conducted by various manual cutting techniques. The only use of herbicides in these tending treatments is by injection, where herbicides are applied to a wound made mechanically on the stems of individual trees (Ex. 603A, pp. 133-134). Figure 7.2 indicates that thinning, improvement and pruning treatments made up 11% of all tending treatments carried out in the area of the undertaking from 1986/87 to 1991/92; manual cleaning treatments accounted for 6% and ground application of chemicals accounted for 3%.

Herbicides Used In Northern Ontario Forests

In Ontario, there are currently five herbicides registered and scheduled for forestry use: 2,4-D and glyphosate, which are aerially sprayed, and simazine, hexazinone and picloram, which are registered for ground application only (Ex. 603A, p. 71). Dr. Robert Campbell,

Figure 7.2
Tending Treatments on Crown Land in the
Area of the Undertaking, 1986/87 - 1991/92
Percentage Treated by Each Tending Method



Source: Update of Ex. 603A, p. 188, MNR Question 36

provincial herbicide specialist with MNR, described these herbicides and their use in forestry in the area of the undertaking.

The herbicide 2,4-D belongs to the phenoxy family of herbicides, and has been used in Ontario for over 30 years. For forestry use, 2,4-D is registered for both aerial and ground application. In general, broadleaf plants are sensitive to 2,4-D and grasses are not. 2,4-D provides control of woody species such as pin cherry, birch and alder, and is used where these species are the major competitors. Poplar is controlled well in some but not all cases, and maple is poorly controlled by 2,4-D. Grass and raspberries, competitors on rich, productive sites, are virtually unaffected by 2,4-D (Ex. 603A, pp. 204-7).

Glyphosate was registered for forestry use in 1984 for both aerial and ground application. Glyphosate controls a wider range of plant species than 2,4-D. Glyphosate controls the same brush species as 2,4-D, but it also effectively controls poplar, raspberry and grass. Glyphosate site preparation treatments must be delayed for about two years after harvesting and mechanical site preparation, because these physical disturbances promote root suckering, stump sprouting and germination of seeds (Ex. 603A, pp. 207-9). Unlike 2,4-D, which is absorbed through both the roots and foliage, glyphosate is absorbed only through the foliage, and will not control plants that germinate or sucker after application.

Simazine is absorbed by roots, not foliage, so it must be applied to the soil surface and be washed in by rainfall. Simazine is strongly bound to clay and organic matter in the soil, and does not penetrate soil much below 5 cm. This is why forest tree species such as conifer seedlings, with roots deeper than 5 cm, will not be affected, but weed seeds near the soil surface will be controlled. The thick humus layer found on most cutover sites binds the simazine and make it ineffective; therefore, it is used primarily on old fields in southern Ontario, which have a thin humus layer. For forestry purposes, simazine is registered for ground application only, and has been used in Ontario since 1969 (Ex. 603A, pp. 209-12).

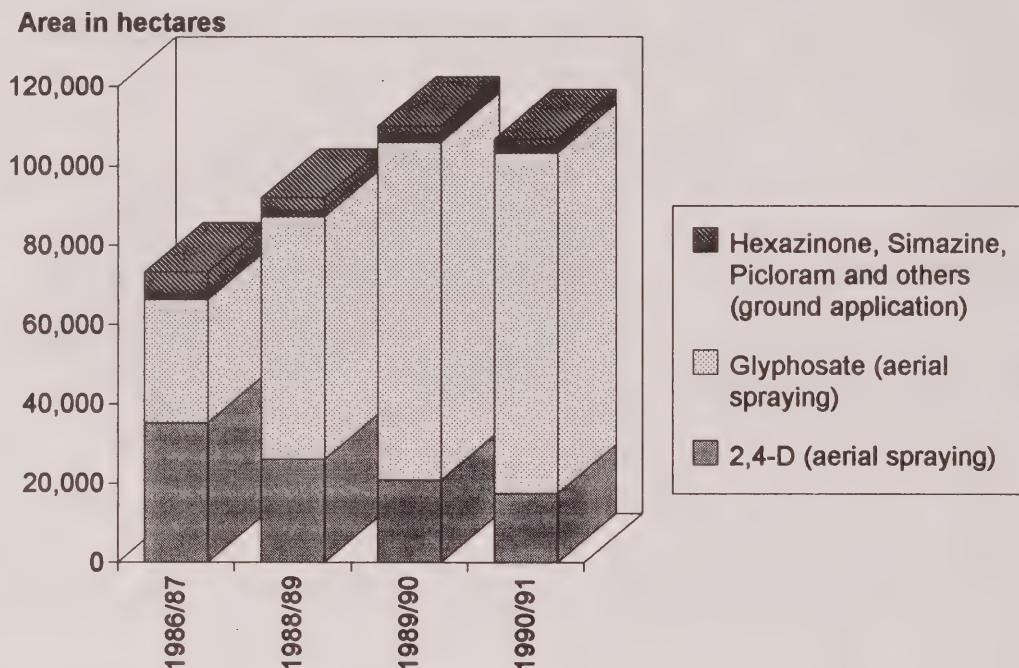
Hexazinone is taken up primarily through the roots, and like simazine, does not harm crop trees mainly because their roots are deeper than the chemical penetrates. Different tree species have different levels of tolerance or resistance to the hexazinone. For example, red pine is more tolerant than spruce which is more tolerant than jack pine. Hexazinone is not as tightly bound to clay and organic matter in the soil as simazine, and so it penetrates deeper. This means that crop trees planted in fine-textured (i.e. clay) soils are more tolerant than trees planted in coarse (i.e. sandy) soils. For this reason, hexazinone is currently registered for use only on fine-textured soils. Hexazinone is registered for ground application only, and has been since 1984 (Ex. 603A, pp. 213-16).

Picloram is absorbed by roots and foliage. Grasses and some broadleaf species are tolerant, and conifer species are not. Picloram is registered for application only to cut surfaces of individual undesirable stems, and is used for cull tree removal to improve hardwood stands. This has been done in Ontario since 1980. Picloram is available for this treatment in a product called Tordon 101 which is a mixture of picloram and 2,4-D. It is more effective than 2,4-D or glyphosate alone in controlling maple (Ex. 603A, pp. 216-17).

Dr. Campbell described the forestry use of herbicides in Ontario in 1986/1987 (Ex. 603A, pp. 227-36). Because of the way the data were collected, he could not show detailed use figures for the Area of the Undertaking alone. The charts provided by Dr. Campbell were updated by MNR at the Board's request to cover the years up to 1991/92 (Board Question 37).

Figure 7.3 indicates that 2,4-D and glyphosate were of about equal importance in terms of percentage of herbicides used in Ontario in 1986/87, at 48% and 42% respectively. But by 1990/91, the use of 2,4-D had decreased steadily to only 16% (about 14,000 hectares) and glyphosate had increased to 80% (77,000 hectares). Hexazinone, simazine and picloram account for a much lower percentage because they are registered for ground use only.

Figure 7.3
Use of Herbicides in Forestry in Ontario, 1986/87 - 1990/91
Area Treated with each Herbicide



Source: Update of Ex. 604A, p. 228, MNR Question 7

In 1986/87, MNR and FMA holders each treated about half of the total area treated with herbicides in Ontario and by 1990/91, MNR treated only 26% and FMA holders 74% (Ex. 6034, p. 230, and updates in MNR Question 38). In 1990/91, 93% of the application was aerial, and only 7% ground (Update of Ex. 603A, p. 233; MNR Question 39, p. 4).

Dr. Campbell gave an example of herbicide use at a district level to make the point that herbicides are applied to a small area of forest. In the Thunder Bay District in 1986/87, of the total area of the District (2,845,100 hectares), only 6,717 hectares (or 0.24%) was treated with herbicide for forest management. The size of the area sprayed with herbicides was about one quarter of the area which was harvested that year (28,049 hectares) and less than 0.5% of the district's production forest (Ex. 603A, pp. 229, 234-35).

Dr. Campbell provided a table entitled "Ontario Herbicide Statistics: Forestry vs. Other Users" (Table 8, Ex. 603A, p. 237) and we reproduce it as Figure 7.4. All of the herbicides registered for use in forest management have agricultural and non-crop registrations as well (Ex. 603A, p. 71). The production forest of Ontario is about eight times larger than the

land in agricultural crops in Ontario, but almost eight times as many hectares of agricultural cropland as forest land were treated with phenoxy herbicides (including 2,4-D) and glyphosate. This means that 12% of the agricultural cropland, compared with 0.21% of the production forest, was treated with the same chemicals. In 1986, homeowners in Ontario purchased more 2,4-D for lawn care than was used in forestry. MNR points out that most agricultural and lawn treatment is carried out repeatedly on the same piece of land. "By comparison, forest management usually requires only one or two applications to a given area during the rotation age of the managed stand – usually 60 to 90 years," he said (Ex. 603A, p. 236).

Figure 7.4
Ontario Herbicide Statistics: Forestry vs. Other Uses

Total area of Ontario	106,858,200 ha
Area of production forest	35,307,076 ha
Total area in agricultural crops	4,161,800 ha
<hr/>	
Total area treated with herbicide for forest management in 1986	73,338 ha
Area treated with 2,4-D and glyphosate for forest management in 1986	66,348 ha
Area of agricultural crops treated with phenoxy and glyphosate in 1983	503,310 ha
Area treated with 2,4-D for forest management in 1986	35,249 ha
Area of utility rights-of-way treated with 2,4-D in 1986	20,499 ha
Area of roadsides treated with phenoxy in 1983	30,600 ha
Area treated with 2,4-D by commercial lawn care companies in 1986	23,937 ha
<hr/>	
Amount of 2,4-D purchased by householders in 1986	97,546 kg
Amount of 2,4-D used for forest management in 1986	87,104 kg
<hr/>	
% of production forest treated with herbicide for forest management in 1986	0.21%
% of agricultural cropland treated with phenoxy and glyphosate in 1983	12.10%
Source: Ex. 603A, p. 237	

Alternative Tending Methods

MNR witness Peter Hynard, management unit forester in Minden District, presented evidence on tending treatments and techniques. We discussed the alternatives to herbicides in site preparation in Chapter 6. Most cleaning treatments to control competition after regeneration are done by aerial spraying of chemical herbicides. Ground spraying may be substituted in small areas where operational concerns or protection of other values preclude aerial spraying. Manual cleaning methods may be used where the desired regeneration is vulnerable to the herbicides being used, in overstocked regenerating stands where the

competing vegetation and the desired regeneration are the same species and in areas where herbicide use is not acceptable (Ex. 603A, pp. 119-20).

Rob Galloway, regional forestry specialist in MNR's Northern Region, presented evidence on the advantages of aerial application of herbicides over manual cleaning and ground-based chemical cleaning, based on the criteria of operational feasibility, cost, effectiveness, worker safety and environmental effects (Ex. 603A, pp. 157-67). He said aerial spraying "is generally the safest and most cost-effective option" (Ex. 603A, p. 168). Mr. Galloway also said aerial application "can provide uniform coverage and uniform results; it does not rely on ground access or site trafficability; its application is not labour intensive, avoiding problems with labour availability; and treatments can be carried out over large areas in a short time" (Ex. 603A, p. 69, pp. 168-71).

OFIA witness Dr. Maxwell McCormack listed a number of problems with manual tending techniques, for example the high costs, potential to damage crop trees, risk of worker injury and ineffectiveness (Ex. 1131, pp. 75-81). He said aerial application is superior to ground application because it results in uniform coverage of the herbicide, minimal site disturbance, lower costs, and less herbicide use (trans: vol. 203, pp. 36082-91). Aerial application of herbicides is also the method of choice for the industry for site preparation and release treatments (Ex. 1311, p. 104).

Effectiveness

Manual cleaning is only temporarily effective compared to chemical cleaning. According to Dr. McCormack, manual cleaning involves cutting unwanted vegetation at ground level, which leaves the root system alive, resulting in resprouting from roots or stumps. This is particularly a problem on productive sites, which almost always require retreatment (Ex. 1131, p. 79).

The evidence of OFIA is that in order to achieve the same results with ground spraying as with an aerial application of herbicides, larger quantities are needed (Ex. 1131, p. 113).

Cost

Rob Galloway's evidence showed that in 1986 the average manual cleaning cost was \$400 per hectare (and the cost usually doubles because of the need for a second treatment). The average cost of chemical aerial cleaning was about \$135 per hectare using glyphosate and

\$40 per hectare using 2,4-D. Based on these figures, he said that chemical cleaning is about nine times cheaper than manual cleaning (Ex. 603A, pp. 158-59).

The costs in 1986 for ground application of herbicides ranged from \$150 per hectare for 2,4-D to \$200-\$300 per hectare for glyphosate or Hexazinone (Ex. 603A, p. 167). Mr. Galloway said that the costs in 1988 were \$137 per hectare for 2,4-D and \$202 per hectare for glyphosate, because the costs for both chemicals had come down (trans: vol. 112, pp. 18667-68).

Operational Feasibility

Manual cleaning treatments are very labour-intensive and seasonal. Productivity in manual cleaning is low (usually 0.3-0.5 hectares per person per day), there is a shortage of labour and it is impractical to hire enough people to perform the work in the time available (Ex. 603A, p. 157). Access limits manual cleaning since many of the sites in the Area of the Undertaking are only accessible in the winter, but snow interferes with manual cleaning by covering crop trees and competing vegetation and closing bush roads.

FFT submitted evidence that the U.S. Forest Service has achieved successful silvicultural operations without herbicides in the Suislaw National Forest in the Pacific Northwest (Ex. 1194 and Ex. 1195) and without aerial spraying or any use of 2,4-D in the Ozarks (Ex. 1236, p. 7 and Ex. 1237, p. iv). OFIA argued that the overall Forest Service policy is not to eliminate herbicide spraying. In any case, we note that these examples do not establish that manual tending is a practical alternative for the vast forests of Northern Ontario.

Worker Safety

Dr. McCormack's evidence was that the operation of a hand release program increases the risk of worker-related injury, because of the use of power saws and sharp cutting tools (Ex. 1131, p. 78). Mr. Galloway added that worker injuries in manual cleaning operations are also caused by vehicle accidents, falling objects, unsure footing, sharp cutting equipment, high noise levels and exposure to fuels. He said that "manual brush control is generally regarded as very hazardous by silviculture workers, and intensive training is required to minimize the risk" (Ex. 603A, p. 160). With regard to ground application of herbicides, Mr. Galloway said that large spray volumes and proximity to herbicide spray and treated foliage increase the potential for worker exposure to the herbicide being used. He said that although "these amounts are not in excess of acceptable levels for human health, they nevertheless can be reduced by means of aerial application" (Ex. 603A, p. 167). Exhibit 622

is a summary of the injuries suffered by workers conducting tending operations from 1980 to 1986, which includes 25 injuries reported for chemical spraying compared with 466 from mechanical and manual tending.

New Alternatives to Herbicide Spraying

Dr. Robert Wagner of the Ontario Forest Research Institute in Sault Ste. Marie presented MNR's Vegetation Management Alternatives Program (VMAP) in MNR Reply evidence (Ex. 2272, pp. 28-30). The VMAP goal is "to gradually reduce dependence on herbicides in Ontario's forests by developing alternatives and gaining a better understanding of forest ecosystems through research, education and field delivery" (Ex. 2291, p. 4). Dr. Wagner told us that the VMAP program was initiated in May 1991 as part of the sustainable forestry program of MNR (trans: vol. 391, pp. 67296-97).

Dr. Wagner said the announcement of the program included a goal of a 20% reduction of aerial application of herbicides in the 1991/92 fiscal year, and that target was met (trans: vol. 391, p. 67323). Asked by FFT whether this indicates that MNR and the industry can live with less herbicides, Dr. Wagner said foresters are concerned that, even under current restrictions, they are not able to treat everything that should be treated. He clarified that the alternatives to aerial application of herbicides are more expensive, so that "if the funds are not available, which is the case this year, sites just go untreated" (trans: vol. 391, p. 67326).

Dr. Wagner described trials of new tending techniques such as grazing sheep (trans: vol. 391, p. 67298). We also heard for the first time during this cross-examination that one of the new techniques for existing herbicides that MNR is experimenting with is the application of herbicides in either pellet form or liquid form during the scarification process (trans: vol. 391, p. 67327).

In Condition 102 we order MNR to investigate new tending and protection technologies, test alternative control methods and support research initiatives.

The Effectiveness and Necessity of Herbicide Tending

FFT submits that MNR is only now undertaking studies on the efficacy of herbicides and therefore cannot claim that there is scientific evidence of success (FFT Final Argument, p. 327). Peter Hynard told us that past tending results were not recorded or assessed in the same way as regeneration, but that MNR foresters have observed the success of herbicide

spraying through field inspections before and after treatment and consult with one another on the observed results (trans: vol. 108, pp. 18056-58). Cindy Krishka, a vegetation management forester for MNR, also said that it is impossible to quantify long-term benefits from tending without going through one rotation age, which has not happened in Northern Ontario (trans: vol. 109, p. 18254).

Dr. McCormack, a widely recognized expert in North America on the use of herbicides in timber management planning with 37 years of professional forestry experience, testified that there is little growth data available in North America on the effects of herbicide tending because foresters believe the growth is so dramatic following spraying that there is no necessity to measure it (trans: vol. 203, p. 36173).

The evidence we received on how effectively herbicides promote the survival and growth of desired species came from two sources: scientific literature and first-hand observations.

Evidence in the Scientific Literature

Ms. Krishka presented the results of her review of the results of 116 studies of cleaning treatments. She concluded that while some studies reported negative results, the overall conclusion is a general trend towards increased volume. Ms. Krishka made four conclusions based on these 116 studies:

- (1) the short-term results of cleaning are documented and positive;
- (2) long-term benefits are expected as a result of increased early survival;
- (3) early gains in stem and stand volume are expected to be realized at the time of harvest; and
- (4) short-term results cannot be directly extrapolated to long-term results (trans: vol. 109, pp. 18252-54).

Dr. McCormack presented evidence from 21 scientific studies assessing the efficacy of chemical control treatments (Ex. 1131, pp. 115-143; summarized in OFIA Final Argument, pp. 263-66). He concluded that all of the treated areas described in the studies reported a much higher percentage increase in volume over time when compared to that experienced on the control plots (trans: vol. 206, pp. 36725-49).

Austin Pond Study

Dr. McCormack described to us the results of his tending treatments carried out over 13 years in the Austin Pond Area in Bald Mountain Township in Maine. His studies were essentially efficacy tests on the first aerial applications of glyphosate in North America. They compared blocks sprayed with glyphosate, 2,4-D and those with no treatment, so that side-by-side comparisons could be made. After eight years, the treated blocks had developed into a viable forest, whereas the untreated block had developed into a stand that was not productive by any standards. Dr. McCormack said that the efficacy results for glyphosate and 2,4-D were very similar. He demonstrated the difference between the sites in impressive slides in Ex. 1134 and Ex. 1135 showing increased growth, more crop tree stocking and healthier and more vigorous crop trees from herbicide tending. Dr. McCormack told us that the tests at Austin Pond demonstrated superior volume growth for all areas treated with herbicides compared to untreated blocks.

Observations of Tending Experts

Several OFIA witnesses who are tending experts gave their first-hand observations of the results of herbicide tending. The industry's case studies (Ex. 1100) demonstrated superior stocking results for blocks which received herbicide treatments, greater increases in relative growth/volume after herbicide treatment, and anticipation of greater yield from treated blocks.

For MNR, Mr. Hynard said that, in his opinion, there is a 50% faster growth response in crop trees from thinning, which is one tending method. He admits these results are not a scientific study, but said he has looked at many trees and the results are representative.

The evidence of MNR and OFIA experts that chemical release is the most effective technique for suppressing competition was unchallenged. FFT, which wants to limit chemical herbicides, did not call its own evidence or witnesses on herbicide spraying except for George Marek, who supported the use of chemical herbicides on intensively managed plantations if the public accepts the program (trans: vol. 259, pp. 46572-73). Mr. Marek would not, however, support using chemical herbicides in his concept of multi-purpose forests (trans: vol. 259, pp. 46581-82).

All the parties agree to the need for maintenance by tending and protection and the dispute is over the methods used. Dr. McCormack's evidence was that the single biggest impediment to establishing desirable regeneration is competing vegetation. The use of

herbicides as a release and suppression tool with respect to competition, represents the most practical tending method available in the area of the undertaking (trans: vol. 203, pp. 36072-77). Dr. McCormack presented the Industry's position that "the use of authorized herbicides in timber management is essential to achieve effective vegetation control" (Ex. 1311, p. 114).

Findings

FFT proposed that aerial spraying of all chemical herbicides be prohibited and that ground spraying of 2,4-D be allowed only as a last resort if the other vegetation management methods of no treatment or non-chemical treatments were demonstrated to be ineffective or too costly. FFT did not convince us that the aerial spraying of herbicides should be prohibited as a tending method. We are persuaded by the experience of expert witnesses for MNR and OFIA and by the data on herbicide effectiveness that aerial spraying of 2,4-D and glyphosate is essential to regenerating conifer stands. FFT failed to convince us that manual tending methods could substitute for aerial spraying.

The evidence establishes chemical herbicide spraying to be an effective means of tending and essential to the regeneration of conifer species. There is today no effective, practical or affordable alternative to herbicide tending. While we approve the continued use of herbicides in timber management planning, we are also ordering MNR to investigate new technologies and to test alternative means of tending. We support MNR's policy, as expressed in the sustainable forestry program, for "the need to systematically reduce dependence on chemical herbicides by using environmentally sensitive alternatives as they become available" (Ex. 2315).

FFT proposed detailed site-specific analysis to determine the need for tending projects. We find these proposals would be too difficult to implement and are unnecessary. For example, for each vegetation management project, FFT would require MNR to analyze and report to the MOEE on eleven aspects including the "proportion of the site on which vegetation is or may become a problem and the degree to which it can be tolerated." We are convinced by the evidence of tending experts that foresters have the experience to assess the need for tending on a site-by-site basis. We considered FFT's proposals on monitoring and evaluation of vegetation management projects and for public participation in these decisions and aspects of these are reflected in our Conditions of Approval.

We are approving Conditions 26, 29, 35, 38 and 40(b)(ii) which describe the process for planning tending treatments and forecasting the level of tending activity. These conditions

deal with herbicide use as an acceptable tending method and spray projects, as we discuss below, are addressed in Condition 74 and Appendix 17.

PROTECTION

Introduction

MNR witness Joseph Churcher reported that, on average, about 15 million cubic metres of Ontario's forests were lost to insects each year from 1977-81, and about 30 million cubic metres lost to diseases annually during that period. The timber harvested annually over the same period was nearly 18 million cubic metres. Although diseases account for the largest annual loss of wood in Ontario, MNR does not have the capability to manage for diseases province-wide (Ex. 603A, p. 84). MNR does have effective management techniques available for insect pest management, and takes action to protect Crown forests from these insects. The industry submits that "protection of the timber resource from unacceptable levels of insect damage is an essential component of achieving a predictable and continuous current and future supply of quality raw material to the industry's mills" (Ex. 1131, p. 66). Industry witness Dr. Roderick Carrow told us that the most important objective in pest management is to keep mature and overmature forests alive because these are the most susceptible to insect and disease and these forests provide most of the merchantable timber in the area of the undertaking (trans: vol. 209, p. 37335).

Most insect damage in the Area of the Undertaking is caused by defoliating the trees, which can also lead to reduction in annual tree growth and to death of the trees. The spruce budworm, gypsy moth, jack pine budworm and the forest tent caterpillar are the major forest insect pests of concern to MNR. The species most affected is balsam fir, which is not as commercially important as spruce or jack pine. Mr. Churcher reported that aerial insecticide treatment has been limited to those four pests since 1983, although the Saratoga spittlebug and oak leaf shredder were treated prior to 1983, as shown in Figure 7.5. OFIA submits that there are 15 major insect pests in the area of the undertaking (Ex. 1131, p. 173).

Forest insect populations are naturally cyclic, and from time to time an insect outbreak can occur. Insect populations can progress from an endemic phase where populations are low and are controlled by natural means, through an outbreak phase where populations increase at a rapidly increasing rate and cause significant damage, and finally to an epidemic phase where populations are high and damage is severe and widespread.

Figure 7.5
Aerial Application of Chemical and Biological Insecticides
For Forestry in Ontario, 1976 - 1988

Year	Pests Treated	Area (ha)	B.t.	Chemical
1976	spruce budworm, Saratoga spittlebug	41,121	2%	98%
1977	spruce budworm, forest tent caterpillar, oak leaf shredder	6,820	26%	74%
1978	spruce budworm, oak leaf shredder, forest tent caterpillar	2,075	54%	46%
1979	spruce budworm, oak leaf shredder	20,551	15%	85%
1980	spruce budworm, oak leaf shredder	11,158	42%	58%
1981	spruce budworm	10,234	68%	32%
1982	spruce budworm	3,454	90%	10%
1983	spruce budworm, oak leaf shredder	4,081	78%	22%
1984	spruce budworm	3,697	84%	16%
1985	spruce budworm, jack pine budworm, gypsy moth	250,380	100%	0%
1986	spruce budworm, jack pine budworm, gypsy moth	735,759	100%	0%
1987	spruce budworm, jack pine budworm, gypsy moth	222,531	100%	0%
1988	spruce budworm, jack pine budworm	27,807	100%	0%

Source: Ex. 634

Alternative Methods of Insect Control

Mr. Churcher described six major forms of insect control: legal or regulatory, mechanical, genetic and reproductive, cultural, biological and chemical.

Legislation may be used to prevent the introduction or spread of pests through the imposition of embargoes, quarantines, inspections, treatments and certification of plants. These legal or regulatory control measures are under the direction of Agriculture Canada. Mechanical control measures include pruning infested branches and applying sticky bands to trap crawling insects. These measures are most commonly used in orchards and nurseries. Genetic and reproductive control measures include selecting and hybridizing trees

that are more resistant to attack and altering the reproductive and genetic characteristics of insect pests and predators. Cultural control measures rely on silvicultural treatments, for example: the selection of seed and stock; site preparation techniques including prescribed burns; conducting sanitation cuts; cultivation to reduce competition; and adjusting planting and harvesting dates.

Biological control measures are intended to destroy or suppress insects by the introduction, encouragement or artificial increase of their natural enemies, such as parasites, predators and diseases. These biological controls, such as viruses, must be registered under the federal *Pest Control Products Act*. Chemical control involves the use of chemical insecticides regulated under the federal *Pest Control Products Act* (Ex. 604A, pp. 90-92). Mr. Churcher told us that, historically, insect control in forestry has relied quite heavily on biological and chemical insecticides (Ex. 604A, p. 93). Of the six pest control methods described here, biological and chemical insecticides received the most attention at the hearing.

Insecticides Used in Northern Ontario Forests

Mr. Churcher stated that there are relatively few insecticide products actually registered for forestry applications (Ex. 604A, p. 100). He described the five main types of insecticides: chemicals, biologicals, botanicals, inorganics and miscellaneous synthetics.

Chemical compounds are the most common type of insecticide. There are three families: the organochlorines (chlorinated hydrocarbons), the organophosphates and the carbamates.

The organochlorines have the disadvantage of being persistent (meaning that residues of the pesticide remain in the environment). There are few examples of this family of insecticides in use today, but a few, such as methoxychlor and dicofol (Kelthane), remain. The organophosphates do not have the residual characteristics of the organochlorines. Examples of this family include acephate (Orthene), diazinon (Basudin), dichlorvos (Vapona), dimethoate (Cygon), fenitrothion (Sumithion, Folithion), and malathion (Cythion). The third family of synthetic chemicals is the carbamates, for example, aminocarb (Matacil) and carbaryl (Sevin) (Ex. 604A, pp. 102-3).

According to Mr. Churcher, five of these chemical insecticides were used in aerial applications in Ontario forests from 1976 to 1984: acephate, aminocarb, carbaryl, fenitrothion, and malathion (Ex. 604A, p. 106, Table 1). Chemical insecticides have not been applied aerially since 1984, but have still been applied from the ground (trans: vol. 209, pp. 37579-80).

We did not receive from MNR a complete listing of all pesticides currently federally registered and provincially approved for use in forestry. Kathleen Murphy, counsel for MNR, said during the hearing that MNR is not asking us to approve the use of specific products (trans: vol. 101, p. 16893), and further, that:

... there are individual registrations in the neighbourhood of 30 to 40 individual registrations with respect to these particular products. I don't think the board is really interested in embarking in this hearing into going through 30 or 40 product registrations to determine whether they were reasonable. I don't think any of us are interested in doing that.

(trans: vol. 101, p. 16896)

According to the authors of the ESSA report to MNR on Environmental Effects of Pesticide use for Timber Management in Ontario, "there are four insecticides currently considered for use in timber management in Ontario: *Bacillus thuringiensis* (B.t.), aminocarb, carbaryl, and fenitrothion" (Ex. 604C, pp. 13-14), of which the latter three are chemical insecticides. These four insecticides received the most attention in evidence in the hearing.

Biological insecticides are the second major category of insecticides. These include naturally occurring bacteria, viruses and fungi that cause diseases in specific insects. They are often very host-specific, and thus limited in their usefulness. The best-known example is B.t., a bacterium used to control a number of defoliating caterpillars such as the spruce budworm, jack pine budworm, gypsy moth and tent caterpillar. Mr. Churcher said that the only other biological insecticide used in Ontario is the Lecontvirus, a nuclear polyhedrosis virus (NPV) for the redheaded pine sawfly (trans: vol. 110, p. 18432).

Botanical insecticides are natural derivatives of plants which exhibit some degree of toxicity to insects. Inorganic compounds derived from minerals or the skeletal remains of organisms may also act as insecticides. Some synthetic compounds use the insect's own hormonal system to confuse and kill the pest and others such as diflubenzuron (Dimilin) interfere with the proper growth of the insects (Ex. 604A, p. 104).

The Policies and Practices of MNR

Integrated Pest Management

MNR and industry foresters and witnesses for FFT all support the concept of "integrated pest management" (IPM). Mr. Churcher described IPM as the integration of the six major

types of control techniques. As an example, he told us that MNR has recently reviewed its strategy for the management of the spruce budworm in Ontario to encompass aspects of the six methods.

The industry emphasized that IPM allows the use of chemical insecticides, where necessary. Dr. Carrow presented the industry's position that IPM could not be realized unless chemical insecticides were available (Ex. 1131, p. 195). MNR takes the position that "the use of pesticides in forestry remains an important part of any Integrated Pest Management Program" (MNR Final Argument, p. 420) and it is this program MNR is asking us to approve for timber management planning. FFT's integrated pest management program would have the goal of eliminating use of all chemical pesticides, including chemical insecticides.

MNR's Policy on Aerial Application of Insecticides

MNR's current policy states that "where alternatives to chemical insecticides are commercially available, reasonably cost-effective, and approved federally and provincially for use, the Ministry will use such alternatives in preference to chemical insecticides." The policy also states that the preferred strategy shall be early intervention.

Aerial spraying against forest insects may be undertaken for any of three purposes: outbreak control, containment and protection. These three purposes correspond to the three stages of insect populations: the epicentre or burgeoning outbreak, the expanding outbreak and the epidemic. Treatment of the first two stages is to suppress the growing insect population, and as such, all stands with a population of insects large enough to cause severe defoliation must be treated. Mr. Churcher testified that while spot infestations on smaller trees are treated using ground spray techniques, aerial application of insecticides has proven to be the most effective treatment for foliage protection on mature trees or large areas of forests (Ex. 604A, p. 67). We received very little evidence on ground spraying of insecticides. At the epidemic stage, the objective of a spray program is simply to protect as much foliage as possible from the insects (Ex. 604A, p. 94). When outbreaks reach the epidemic stage, it is impossible to treat all infested stands, and so MNR will treat forests where the timber will be harvested within 10 years and the susceptible tree species makes up at least 40% of the stand, and "high value" forests such as tree nurseries, research areas, parks, canoe routes and Areas of Natural and Scientific Interest (Ex. 604A, p. 95). Beyond these eligibility criteria, nine additional matters are considered by MNR in selecting areas to treat: history of the infestation, condition of the stand, values being protected, history of spraying, percentage of dominant hardwoods in the stand, consideration of other

management techniques, future plans for the stand, operability of the stand, and the effect of buffer zones on operability (Ex. 604A, pp. 96-98).

Mr. Churcher provided an example of the scale of MNR's insect spray program. In 1986, of 5.3 million hectares of forests infested by the spruce budworm in the North Central region, less than 600,000 hectares qualified as stands eligible for treatment. Of that area, 88,591 hectares was proposed for aerial spraying (less was actually sprayed), 17,458 hectares was already scheduled for harvest and 3,445 hectares for salvage and the remaining 476,675 hectares received no treatment. For the 1987 spray program, then, less than 2% of the total area infested in 1986 was proposed for aerial spraying, and about 15% of the area eligible for treatment (0.3% of the total area infested) was proposed for aerial spraying (Ex. 604A, p. 100).

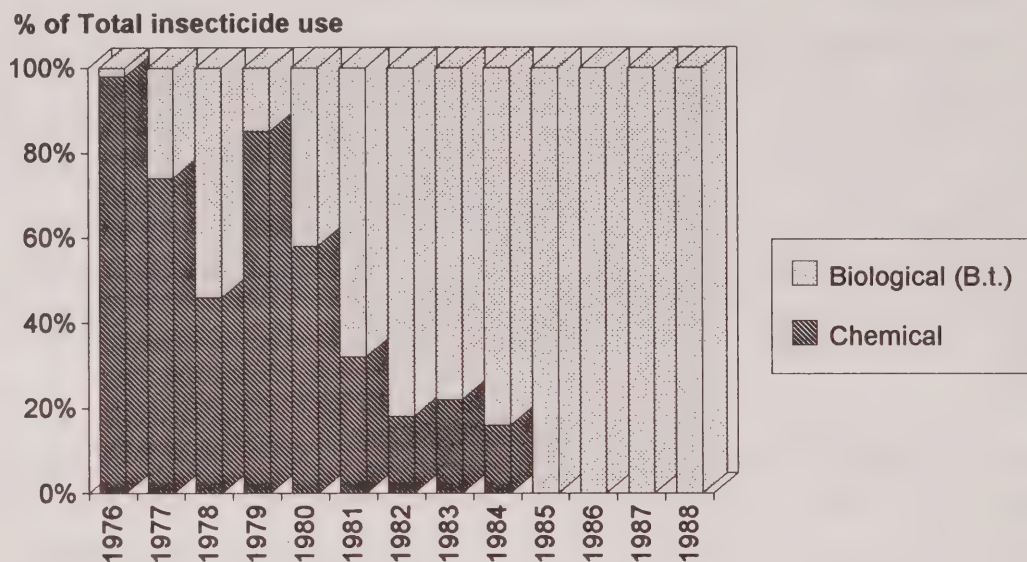
We observe from this example of the North Central region's spray program that the area scheduled for harvest, including salvage, is small compared to the area scheduled for spraying. The obvious question left unanswered is why MNR is not planning accelerated harvest and salvage of timber infested with or threatened by insects. This is a particular concern for the merchantable species such as black spruce, which we note are reported as being lost to insect infestation in much smaller quantities than the less valuable balsam fir. But why is not more merchantable black spruce being harvested before it is destroyed by insects? We were told by MNR that the threat of insect damage is one of the criteria used to identify eligible stands for harvest and to select such stands for harvesting in each Plan and we address this in the findings below. Also, in Chapter 3, we discuss Conditions of Approval (Appendix 13, section 3), in which we order a streamlining of the amendment planning process to facilitate salvage operations.

The Ontario Government's Practice of Spraying B.t. Only

Figure 7.6 shows the relative use of aerial applications of chemical and biological insecticides for forestry in Ontario from 1976-1988. Use of chemical insecticides dropped sharply from 1980 to 1984, and MNR has used only B.t. in its aerial spray programs since 1985. Mr. Churcher said B.t. was as effective as chemical insecticides against the pests requiring treatment and its cost was only marginally higher than chemicals (Ex. 604A, p. 106).

Mr. Churcher also told us that, in his role as the forest entomologist for the ministry and as a member of the committees planning the insecticide spray program in 1985 and 1986, he and the Regional and District Committees recommended the use of chemical insecticides

Figure 7.6
Relative Use of Aerial Application of Chemical and Biological
Insecticides for Forestry in Ontario, 1976 - 1988



Source: Ex. 634

on some portion of the spray areas, as well as the use of B.t. on other areas (trans: vol. 110, pp. 18417-18).

In May 1985, then Minister of Natural Resources Mike Harris announced that the 1985 spray program would use only the biological insecticide B.t., saying this alternative was "the most acceptable from an environmental standpoint" (Ex. 635, p. 2).

In February of 1986, the new Minister of Natural Resources, Vincent Kerrio, announced that "under the circumstances of a minority government, we have decided to proceed with a biological spray program this year. This was the only way we could get all-party support for any aerial spraying program to battle the present budworm and gypsy moth infestation."

Mr. Churcher said that in preparation for the 1987, 1988 and 1989 program, the committees did not recommend the use of chemical insecticides, because "it was felt at the time that B.t. would provide adequate results" (trans: vol. 111, p. 18484). Mr. Churcher said that "in, effect, the Minister was not placed in the position that he had to make a decision: Are we going to use chemical or B.t. this year, because the recommendation that came forward was for B.t. only" (trans: vol. 112, pp. 18808-9). He stated that the regional working committees still consider the use of chemical insecticides every year in planning the aerial spray programs, and that they could recommend in the future that chemical insecticides be used

(trans: vol. 111, p. 18485). We asked Mr. Churcher why MNR staff would even consider the option of using chemical insecticides, when several successive ministers have announced that chemical insecticides would not be used. Mr. Churcher replied that his understanding of the ministerial decisions is that they applied to only one year, and that the need would be looked at again in subsequent years (trans: vol. 112, pp. 18809-10). The final decision every year lies with the minister (trans: vol. 111, pp. 18470-71).

MNR told us it would prefer using alternatives to chemical insecticides, but urged us to order Conditions of Approval that would permit MNR to use chemical insecticides after going through the planning program as laid out in Appendix 14.

MNR argues that biological and chemical control methods are not equally effective in all situations, or cost-effective against all competing vegetation or pests, and are not necessarily available from manufacturers at the time they are required. MNR submits that for these reasons, and because of the low toxicity of all registered and approved pesticides and their limited and careful use in timber management, all registered and approved insecticides should be available for use in timber management in the manner prescribed by federal and provincial regulators.

The Forest Industry's Position on Chemical Insecticides

The central position of OFIA is that the 1985 moratorium on the aerial spraying of chemical insecticides should be overturned and that MNR should be required to follow its own policy on integrated pest management by implementing chemical spraying of insecticides. All of OFIA's proposals go towards achieving this objective:

- (a) OFIA proposes that the priority of aerial spraying be given to early pest intervention, i.e. outbreak control before containment of foliage protection.
- (b) OFIA proposes that MNR be required to consider using chemical insecticides where no other equally or more effective insect controls are available or practical and their use would be subject to compliance with all applicable federal and provincial regulatory controls.
- (c) OFIA proposes even more explicitly that MNR will not prohibit using chemical insecticides unless (a) equally or more effective insecticides are available and practical and (b) their prohibition is warranted by the scientific evidence of establishing the likelihood of unacceptable environmental or health impacts.

- (d) OFIA proposes that MNR must analyze the potential effects of not using chemical insecticides and the results of such analysis must support the rejection of chemical insecticides before MNR can make a decision not to use them.
- (e) OFIA proposes that MNR support research and development of new insecticides including chemicals.
- (f) OFIA proposes that MNR research and develop new quantitative standards to assess the effectiveness of foliage protection programs.
- (g) OFIA proposes that MNR establish standards to assess the effectiveness of programs for outbreak control and outbreak containment.

Need for Chemical Insecticides

Dr. Carrow testified that the insect control technology available in Ontario is inadequate for the variety of insect problems encountered (Ex. 1131, p. 164). Of the 15 major insect pests Dr. Carrow identified in the Area of the Undertaking, there are insecticides registered to treat 13, but biological insecticides for only three (trans: vol. 196, pp. 34791-92). In Dr. Carrow's opinion, the Government's "no-chemical policy" leaves the timber manager with no control agents available for 12 of the major pests found in the Area of the Undertaking (trans: vol. 196, p. 34796). Dr. Carrow said that he expects that some of these 12 pests may require control programs in the future. He forecast a high probability that sawflies and white pine weevil will cause an unacceptable level of damage (trans: vol. 196, pp. 34815-16). OFIA witnesses George Stanclik, Robert Tomchick and Philip Bunce all testified that they are currently experiencing problems with increasing populations of root collar weevil and white pine weevil in their young plantations (trans: vol. 196, pp. 34816-18).

Research and Development on Chemical Pesticides

Dr. Carrow and Mr. Tomchick presented the industry's position that research and development of more biological and chemical insect control agents should be supported and encouraged (Ex. 1131, p. 189). The industry submits that the policy of "no chemicals" adopted by the Minister of Natural Resources is a strong deterrent to research and development of new insect control products for timber management and that the combination of low demand, regulatory restrictions and adverse publicity has discouraged the development of new insecticides for Canada's forest industry.

Effectiveness of B.t.

Dr. Carrow said chemical insecticides have been more effective than B.t. in the spruce budworm control program in New Brunswick (trans: vol. 209, p. 37322). He referred to the report "Protection Spraying Against Spruce Budworm in New Brunswick," 1988 by Nelson Carter (Ex. 1136, MNR Interrogatory No. 7) which included an analysis of the effectiveness of the 1988 treatment by B.t. and fenitrothion and concluded that the results were far superior with fenitrothion. Dr. Carrow argued that B.t. is slower acting than chemicals and the efficacy of B.t. is questionable once larvae densities reach a high level (trans: vol. 209, pp. 37324-26). He claims that "assessment of the effectiveness of the 1986 and 1987 spray program carried out by the MNR shows clearly that the use of B.t. to control gypsy moth outbreaks is highly questionable" (Ex. 1131, p. 171).

Dr. Carrow said rigorous monitoring of the effectiveness of insecticides is critical if the purpose of the undertaking is to be achieved (Ex. 1131, pp. 177-178). OFIA, supported by the expert evidence of Dr. Carrow, submits that MNR should develop standards as the basis for annual evaluation of the effectiveness of insecticides.

MNR witness Mr. Churcher also stated that B.t. is effective only when ingested, and is only effective on those caterpillars which become moths and butterflies. "Other insects, such as sawflies, weevils, beetles and flies, are not affected by B.t. or Lecontvirus. If it becomes necessary to treat stands infested by these other insects the ministry would have to rely on a chemical insecticide, until such time as a biological alternative is found" (Ex. 604A, p. 108). In contrast, chemical insecticides tend to be less specific to their hosts and are effective on a wider range of insects. Mr. Churcher also stated that B.t. may or may not be as effective as chemicals in treating the beginning of an insect outbreak, where the number of insects is increasing at a great rate (trans: vol. 111, p. 18487).

Findings

OFIA failed to convince us to order the removal of MNR's "no chemical insecticides" spray policy. We carefully considered the evidence of the forest industry's expert witnesses to support the position that chemical insecticides are needed to protect the timber resource and that they have advantages of cost and effectiveness over biological and other pest management alternatives.

We are persuaded by the thirteen years of experience MNR has had with its policy of using alternatives in preference to chemical insecticides, and none in the past eight years, that this

objective is reasonable and is being successfully achieved. MNR told us that the B.t.-only aerial spraying program begun in 1985 has proved as effective as chemical insecticides against the type of pests that have required treatment since then. We conclude, therefore, that the aerial spray of chemical insecticides is not essential for pest management purposes in forests in the Area of the Undertaking. Mr. Churcher observed that if other types of pests become a problem in the future and there is no biological agent to treat them, MNR would have to rely on a chemical insecticide (Ex. 604A, pp. 105-8). MNR continues actively to promote and support research and development on insect control techniques that will further reduce its reliance on chemical insecticides (Ex. 604A pp. 108-9). We are persuaded that the policies of MNR accurately reflect social and political concerns about limiting the introduction and use of non-essential chemical substances into the forest environment.

We conclude from the evidence that chemical insecticide spraying is not essential to insect pest management in our forest. We order in Condition 69 and Appendix 14 continuation of MNR's integrated pest management approach, dating from 1980, which states "where alternatives to chemical insecticides are commercially available, reasonably cost-effective, and approved federally and provincially for use, the ministry will use such alternatives in preference to chemical insecticides." Our approval leaves open the possibility of using chemical insecticides in extraordinary circumstances that have not been experienced in the past eight years and, in our view, are unlikely to emerge as other than exceptional or emergency situations.

In our view there is inadequate information in the Plan to make the determination that harvest or salvage operations are being planned to minimize insecticide spraying or to use merchantable timber before it is destroyed by pests. The public needs to have confidence that the Plan author is making every attempt to salvage merchantable timber as a means of insect pest management. Salvage operations are included as an insect management option in Appendix 14, section (1)(c)(iv), of our Conditions of Approval but we believe it is necessary for a statement to be made in the Plan describing the Plan author's objective for using harvest and salvage operations as an insect pest management option. We are ordering Condition 37:

- 37. The Plan author shall describe the size of the area planned for harvest operations and the size of the area planned for harvest required for the reason of insect pest management including accelerated harvest operations, redirected harvest operations and salvage operations. The Plan author shall also describe, by species, the extent to which these harvest activities will mitigate or prevent damage to timber and the impact these harvest activities will have on the extent of spray operations.**

PLANNING AND CONDUCTING AERIAL SPRAY OPERATIONS

MNR proposes separate planning processes for herbicide and insecticide spray programs in Timber Management Planning because, unlike the certainty that allows for long-term planning of herbicide use, insecticides are sprayed only as needed. All spray programs require public notice and the approval of the Ministry of Environment and Energy.

Herbicide spraying is considered to be a tending operation and is planned in the same way as harvest and renewal. First, 20-year eligible areas are identified, then areas selected for tending with herbicides are identified in the five-year Plan and finally the Annual Work Schedule announces the approved operations that will take place that year.

Herbicide and insecticide spray programs cannot proceed without project descriptions including all details of public notification and the planning for operations, safety and security and a requirement that a post-operations report be approved by the Ministry of Environment and Energy under the *Pesticides Act*. We are requiring that MNR give the public two notices of pesticide spraying: the first is to be at least 30 days before the anticipated date of the spray operation, the second is to be issued seven days before spraying is done. Our Conditions of Approval (Appendices 2, 3, 4) contemplate that "whatever modifications are necessary in the circumstances" can be made for the service and contents of notice. The 30-day and 7-day public notices of spray operations, however, are a minimum requirement (Appendix 3, part D, sections (1)(a) and (1)(b)). Mr. Churcher identified two minimum requirements for spraying operations: approval of the specific project description by MOEE and public notice (trans: vol. 142, p. 24253).

Mr. Churcher described for us how insecticide operations are planned (Appendix 14 and Condition 69) beginning with the identification of a pest problem in the fall of the preceding year and the analysis of options done by special multi-disciplinary district and regional committees and co-ordinated by a provincial committee (Ex. 869). MOEE is always invited to sit on these committees. We believe that a representative of the Local Citizens Committee should have membership in an advisory capacity on the district and regional multi-disciplinary committees because of public concern about the potential health and environmental effects of aerial spraying of chemical and biological insecticides, as suggested by FFT in cross-examination. In our view it would be preferable for this representative to be the same LCC member who serves on the planning team and is paid for this time (Appendix 1, part D, section 3(e)). We do not see the need for all LCC representatives to attend meetings of the regional committees, if their districts are not affected by the planning.

The eligibility criteria used to identify areas for insect pest management are described on p. 249. Using insecticides is one management option considered among others including no treatment and accelerated, redirected or salvage harvest operations. The three harvest options involve amendments to the Plan. Where the selected course of action is aerial spraying of insecticides, the planning process requires an information centre for public review and comment on the proposed insecticide spray program and a second stage of notice for the public to inspect the approved program. We understand from MNR's evidence that it will attempt to combine the public notice and information centres for insect pest management with the overall timber management planning process to develop the Plan, but sometimes the planning for insecticide spraying may need to be "telescoped" (or compressed) and in this situation, the Stage 2 notice for public inspection of an approved pest management plan may also serve "double duty" as the 30-day notice before spraying takes place (Appendix 3, part D, section (1)(a)).

We were persuaded by FFT that although MNR cannot always forecast insect spraying with certainty, the public should be given as much advance notice as possible of planning for spray areas. We have MNR's commitment that insecticide spray plans, if known, (trans: vol. 141, p. 24231) and eligible insecticide spray areas (trans: vol. 146, p. 24972) will be reported in the five-year Timber Management Plan. We are requiring MNR to live up to this commitment in our Condition 22(c) which requires MNR to identify if insect infestation is likely to be a problem during the term of the Plan and if insect pest management planning is anticipated. In Condition 40(b)(iii) we require the "areas selected for operations maps" to include areas eligible for insect pest management and areas proposed for spray projects.

It is clearly MNR's intention to provide as much information about insect management planning as possible in the five-year Timber Management Plan. We have Mr. Churcher's evidence that the relatively slow moving and predictable spruce budworm infestation could allow for advanced planning of eligible areas in the Timber Management Plan and in the Annual Work Schedule (trans: vol. 146, pp. 24971-98). We are satisfied that the provisions we are approving for membership of the Local Citizens Committee on the multi-disciplinary district and regional committees and public consultation and notice will prevent situations where the public is uninvolved, misinformed, or surprised by pest management planning, particularly insecticide spraying.

Edward Iskra and Stephen Nicholson, witnesses for MNR on pesticide applications technology, policies and procedures and worker training, gave us detailed evidence on herbicide and insecticide spray operations (Ex. 604A and Ex. 604B and trans: vols. 111, 112, 113). All aerial applications of pesticides on Crown forests are conducted under a permit granted by MOEE. Beginning in 1977, in compliance with an exemption order under the

Environmental Assessment Act, MNR began collecting centralized records on pesticide usage (trans: vol. 111, p. 18512). At about the same time, MNR started a training and licensing program to meet the requirements of the *Pesticides Act* and there are now hundreds of licensed applicators for forest spraying programs. In the late 1970s, MNR began developing various technical manuals and directives (Ex. 639 and Ex. 641) on such matters as public notice, communication procedures including open houses and media briefings and the posting of signs. MNR began posting public notice at pesticide-treated areas in 1978/79 (trans: vol. 111, p. 18521). Operational reviews of spray programs were carried out during the 1980s and their recommendations were used to refine the spraying procedures (Ex. 644 and Ex. 645). With the signing of the Forest Management Agreements, the forest industry became more involved in conducting spray programs under the supervision of MNR.

MNR's operational manuals recognize the differences between herbicide and insecticide spray programs (Ex. 369). Herbicide spray blocks can be as small as two hectares, a typical cutover is 12-15 hectares, and while herbicides can involve hundreds of hectares, these are smaller than insecticide spraying which can cover thousands of hectares. Mr. Iskra also explained that herbicide spraying involves larger amounts of chemicals, 30 to 60 litres per hectare compared to 1 to 2 litres of insecticides per hectare for pest management.

Mr. Iskra gave us the example of the 1987 Dryden Jack Pine Budworm Spray Plan in which 27,500 hectares were treated (Ex. 604B and Ex. 642). We were impressed with the attention to detail for safety equipment, security of the area, a communication plan involving 30-day notice in the newspapers, a 7-day reminder notice and efforts to contact individual hunters, cottagers and tourist outfitters (Ex. 604B, p. 526). The mail notice was sent to 1,300 people for the B.t. spray program (trans: vol. 111, p. 18568).

Signs are put on spray sites of all known traffic spots and around all spray blocks at chest height in English and French. Based on the evidence we received from Aboriginal communities, we are persuaded of the necessity for signs also to be in Ojicree. Signs must be posted no more than seven days before spraying and must be removed by November 1. Before spraying, it is normal practice to do area control which involves putting up the warning signs and a pre-flight check of security measures (trans: vol. 113, p. 18988). MNR's procedures require written notification, with the telephone number of an MNR contact person, to be sent to all inhabitants and known users within one kilometre of a spray block, that spraying will take place with a particular product and the approximate date of spraying (Ex. 664, Response to Question 5).

One of the most important ways of preventing or mitigating any potential adverse affects of spray operations is to create buffer zones. The Ministry of Environment and Energy's

1986 guidelines, the most recent for which we have evidence, are reflected in MNR's current procedure recommending buffer zones for aerial spray programs in Ontario forests as shown in Figure 7.7. Buffer zones are defined as areas which will not be sprayed. Increased buffer zones may be considered in specific situations such as commercial and municipal water supplies and registered bee yards.

Figure 7.7
Buffer Zones Recommended for Aerial Application
of Pesticides in Crown Forests of Ontario

Designated Areas	Herbicides (1)	Other than Herbicides (2)	<i>Bacillus thuringiensis</i> (B.t.)
Significant Area Named or numbered lakes; rivers, and streams (as gazetted); or those waters identified as locally significant	60 metres	120 metres	no buffer zones
Sensitive Area (3) Critical fish habitats, (e.g. spawning areas, stocked lakes and rivers); identified endangered species habitats; patented land (reduction of buffer zones may be considered with written notification to the owner)	120 metres	240 metres	no buffer zones
Human Habitation (4) Permanent and/or occupied: homes, cottages, logging camps, development areas in provincial parks; (reduction of buffer zones may be considered with written notification to the owner; in the case of provincial parks, written notification to campers is required)	120 metres	240 metres	no buffer zones
(1) 2,4-D and glyphosate (2) Aminocarb, fenitrothion, carbaryl (3) Existing Ministry of Natural Resources guidelines re: noise and disturbance around endangered or sensitive species habitats (e.g. eagle nests) will be adhered to (4) Public notification of Crown land spraying programs is required			
Source: (Appendix IV of MNR Procedure FR 04 10 10, Issued 1987-04-01), Ex. 604A, p. 166			

Peter Kingsbury, who was with the Canadian Forestry Service's Forest Pest Management Institute, explained the different buffer sizes among jurisdictions. For example, the buffers in Ontario's spray program are only 5% to 10% the size of New Brunswick's or Maine's. In New Brunswick the spray programs are in closer contact with human habitation and municipal water supplies than is usually the case in northern Ontario. Mr. Kingsbury also testified that over time, the size of buffer zones has been reduced for all jurisdictions. Reductions in buffer size occurred in Ontario in 1985, reflecting changes in methods of application, in available literature and scientific data and for the purposes of standardizing widths for buffer zones in northern and southern Ontario (Ex. 789, Ex. 799 and Ex. 803).

Findings

Our finding is that planning for pesticide spray programs is appropriate and allows for adequate public scrutiny and input. The Ministry of Environment and Energy is responsible for approving the spraying of herbicides and insecticides in timber management planning. We received no evidence to contradict the conclusion that spray operations are well planned, personnel are trained and licensed, security is good and operations are well-executed with a high degree of operational control. Therefore we are ordering Condition 74 and Appendix 17 setting out procedures for herbicide and insecticide spray programs.

THE ENVIRONMENTAL EFFECTS OF PESTICIDES

Introduction

In this section we discuss the evidence we received, beginning with the potential effects to human health from exposure to herbicides and insecticides, the potential and known effects on the forest environment and the concerns and complaints the public communicated to us about pesticide spraying. MNR and the forest industry were the only parties who brought expert witnesses and submitted extensive written and oral evidence on the environmental effects associated with pesticides.

As discussed earlier (pp. 250) none of the chemical insecticides discussed in the following evidence has been aerially sprayed in Ontario's northern forests since 1984 or earlier. Our Conditions of Approval support the continuation of this practice by the Minister of Natural Resources.

MNR acknowledges that pesticide use is controversial and concerns some of the public. In the Class Environmental Assessment MNR described some of the potential social, economic and cultural effects of spraying pesticides:

The use of herbicides and insecticides/fungicides for tending and protection purposes may create concern for possible health effects among local residents and recreationists. The degree of human exposure depends greatly on human use of the area, the scale and method of pesticide application, and the extent to which agricultural products and natural crops such as berries are exposed to the chemicals. The use of pesticides can reduce the appeal of the treated lands for recreational use for the remainder of the growing season in which they are applied. The local tourist industry may be adversely affected for this period of time. Conversely, the use of pesticides may significantly preserve tourism and outdoor recreational values by maintaining forest cover and scenic qualities which might otherwise be damaged or destroyed by insects/pests.

(Ex. 4, p. 93)

MNR said it relies on the registration process to ensure that the level of risk from proper use of insecticides is within acceptable limits, and makes every effort to limit exposure of workers and others to spray areas. MNR said it has no information to suggest any risks to Aboriginal people from exposure to B.t. spraying. Exposure of Aboriginal communities and their water supplies is limited by applying the "buffer zones recommended for aerial application of pesticides" as outlined by MOEE (Ex. 664, Response to Question 9). No buffer zones are required for B.t., but in the event chemical insecticides are used in the future, the buffer zones set out in Figure 7.7 would apply. Figure 7.7 also shows the buffer zones required for aerial application of the herbicides 2,4-D and glyphosate.

Human Health

MNR's witnesses Dr. Leonard Ritter and Dr. Robert Campbell spoke to the issue of human health and the registration of pesticides. Dr. Ritter is an expert in toxicology and in Health and Welfare Canada's regulation of pesticides in Canada. Dr. Campbell was qualified as an expert in the use of herbicides for forest management.

OFIA witness Dr. Joseph Rodricks, from the Environ Corporation, was qualified as an expert witness in toxicology, specializing in human health risk assessment principles for chemicals. Dr. Nancy Rachman, also from the Environ Corporation, was qualified as an expert in the registration of pesticides in the United States.

Suggestion of A Cancer Risk Associated with 2,4-D

FFT attempted to raise the "suggestion of cancer risk" from 2,4-D with reference to epidemiologic data from the Kansas Study (Ex. 754), the Nebraska Study (Ex. 758), the Western Washington Study (Ex. 1247), two Swedish studies, the Canadian Farm Operator Mortality Study (Ex. 1244) and others. We agree with Dr. Rachman and Dr. Rodricks that these studies do not establish causal relationships, are not statistically significant, are deficient or flawed, failed to find an increased risk and have inconsistent results. One of the epidemiologic studies discussed by the witnesses was a 1989 review by Bond, et. al. The authors of that article concluded that "the total weight of evidence currently available does not support a conclusion that the phenoxy herbicides present a carcinogenic hazard to humans" (Ex. 715). Dr. Ritter agreed with that assessment (trans: vol. 125, pp. 21099-100).

FFT attempted to show that there is evidence of a risk of cancer from the forestry use of 2,4-D with respect to the MOEE Panel of Experts and the Harvard Reports. Joseph Rodricks on the other hand, relied on these reports for his conclusion that 2,4-D has not been established as a carcinogen, and that there is no scientific basis for restricting the use of 2,4-D (trans: vol. 215, pp. 38810-32).

The MOEE Panel of Experts' Report, dated March 23, 1987, concluded that there is "limited evidence of carcinogenicity in man from exposure to phenoxy herbicides. In terms of exposure to 2,4-D specifically the evidence must be regarded as inadequate to classify as a carcinogen" (Ex. 714). The MOEE panel of five North American experts in toxicology, pharmacology, biostatistics and risk assessment, epidemiology and pathology conducted a risk assessment of the carcinogenicity of 2,4-D. Drs. Ritter, Rodricks and Rachman all agreed with the conclusion reached by the MOEE Panel of Experts that there is "insufficient evidence to conclude that existing uses of 2,4-D in Ontario pose a significant human health risk" (Ex. 714, p. 5). The finding of the MOEE Panel of Experts was the basis for the Ontario Pesticide Advisory Committee (OPAC) decision advising the Minister of Environment and Energy that no change be made to current provincial regulatory requirements governing the use of 2,4-D, and the moratorium was lifted in April 1987 (Ex. 720; trans: vol. 122, pp. 20478-81). The MOEE Panel of Experts did suggest a link between phenoxy herbicides and non-Hodgkins lymphoma:

Based on the available epidemiological studies 2,4-D cannot be exonerated as a reason for the excess cancer risk seen in studies involving the phenoxy herbicides conducted in the U.S., Denmark and Sweden, but neither can these studies identify 2,4-D as being the causative agent. Overall, the epidemiological

evidence indicates that a relationship between an increased risk of soft-tissue sarcoma and non-Hodgkins lymphoma with phenoxy herbicide exposure is tenable; however, in regard specifically to 2,4-D, the evidence for human carcinogenicity must be considered as inadequate.

(Ex. 714, p. 5)

The "Harvard Report," entitled "Weight of the Evidence on the Human Carcinogenicity of 2,4-D" was prepared in 1990 by a panel of experts from Harvard University (Ex. 1245). The Harvard study concludes:

While a cause-effect relationship is far from being established, the epidemiological evidence for an association between use of 2,4-D and non-Hodgkin's lymphoma is suggestive and requires further investigation. There is very little evidence of an association between use of 2,4-D and soft-tissue sarcoma or Hodgkin's Disease, and no evidence of an association between 2,4-D use and any other form of cancer.

(Ex. 1245, p. 2)

Dr. Rodricks testified that he was surprised that the conclusions of the Harvard Report linked suggestive evidence for 2,4-D with non-Hodgkins lymphoma because of the difficulty of separating the effects of 2,4-D from other phenoxy herbicides (trans: vol. 214, p. 38579).

To update the evidence on 2,4-D presented in the early years of the hearing, we asked MNR: "Have governments in Canada and the USA finalized or modified their positions on whether 2,4-D is associated with non-Hodgkins lymphoma?" (Board Interrogatory 80). MNR's response was that neither Canada nor the United States has finalized its reviews of the link between 2,4-D and cancer.

FFT also attempted to use the risk assessment evaluation in the Crump report, which Dr. Ritter described as an ultra-conservative, worst-case analysis of potential health effects from exposure to forestry pesticides. He concluded the results show negligible risks. The Crump report (Ex. 716A) is a risk analysis of seven aerially applied herbicides including 2,4-D, glyphosate, triclopyr and picloram, prepared for the Department of Natural Resources in Washington state. Based on the Crump report, which he regards as reliable, Dr. Ritter said he had no concerns that there is a significant risk of negative human health effects as a result of exposure to 2,4-D or glyphosate (trans: vol. 122, p. 20435).

On the issue of worker exposure, we are persuaded by Dr. Ritter's evidence and the Crump risk assessment that forest spray workers are exposed to higher levels of chemicals than any

bystanders and that such exposure occurs primarily through skin contact during mixing and loading operations (Ex. 716, pp. iv-v). Dr. Ritter referred to Table 4.6 of Exhibit 761 which shows a high level of compliance of MNR employees with safety protection clothing for spray operations. Dr. Ritter told us that the Crump risk assessment concludes that there are negligible cancer risks to workers from exposure to 2,4-D and glyphosate (trans: vol. 122, pp. 20409-10). The MOEE study concluded that there is a 5-8 per million risk for ground sprayers and under a 1 in a million risk for aerial sprayers. Dr. Ritter and Dr. Rodricks both said that the worst-case risks determined in the risk assessments by Crump and MOEE are still much less than the worst-case risks accepted by the U.S. Occupational Safety and Health Administration for workers exposed to carcinogens (trans: vol. 121, p. 20341-43).

Human Exposure through Eating Berries

Dr. Campbell said Health and Welfare Canada does not require precautions for eating berries sprayed with glyphosate or 2,4-D. He said that there is no indication of a human health risk from eating sprayed berries but that MNR has put out an "ultra conservative" policy which gives people the choice of not eating berries (trans: vol. 113, p. 18990). Dr. Campbell said that the Ministry recommends that berries not be consumed in the year of spraying from areas which have been sprayed with herbicides other than 2,4-D (Ex. 663; Response to Question 7). Dr. Campbell said that although people can safely eat blueberries sprayed with 2,4-D, the blueberries would have an unpleasant taste (trans: vol. 113, p. 18992).

With respect to herbicides other than 2,4-D, MNR said that because information is not available about whether or not residues occur in berries in areas which have been sprayed with Velpar (hexazinone), Roundup (glyphosate) or Garlon (triclopyr, which is only used experimentally in Ontario), Health and Welfare can not comment on potential health hazards, and, therefore, MNR recommends that berries not be picked in the year of spraying in areas which have been treated with those three herbicides.

While herbicide-sprayed areas are posted, MNR witness Stephen Nicholson said that the signs posted on spray sites do not include the warning about picking berries. We also note that the signs have not been posted in Ojicree (trans: vol. 113, p. 18982), which we believe should be done in the future.

Dr. Campbell and Gordon Craig, an expert toxicologist from Beak Consultants, both told us that 2,4-D cannot be detected in fruit produced one year later. Dr. Campbell also said

that less than 1% of the blueberry picking area is sprayed annually and spraying is in remote areas closed to the public.

Dr. Campbell provided evidence that an average size person of 150 lbs. would have to eat 4.2 lbs (1.9 kilograms) of berries daily for life in order to exceed the allowable daily intake (ADI) of 2,4-D (Ex. 663A, Appendix C). The ADI is an estimate of the largest amount of a chemical to which a person can be exposed each day without adverse effects being anticipated. Mr. Craig calculated that it would be safe for a person to eat 70 grams (about 1 cup) of sprayed berries a day as an acceptable daily intake level, but he conceded that people could easily consume more berries than this on a daily basis and that if they did so they would assume some risk (trans: vol. 217, pp. 39330-34). These two witnesses calculated such starkly different amounts for the allowable daily intake because Dr. Campbell used criteria from the World Health Organization while Mr. Craig used the much lower figure set by EPA in the United States. We are not making a finding as to which level is right, rather we are ordering signs posted so people will know the berries have been sprayed and avoid eating them.

MNR said each insecticide product is labelled with precautions which must be taken with respect to consumption of water, fish, wildlife and berries from sprayed areas. MNR also said that B.t. is registered for application to many food crops without any preharvest interval and it has no information to suggest that any precautions need to be taken with respect to consumption from treated areas.

As for insecticides, Dr. Campbell said MNR does not yet have an official policy or bulletin similar to that for the collection of berries from areas sprayed with herbicides, but he expects it will have a written policy for insecticides in the future. Mr. Churcher said insecticides are generally sprayed in old forests and not recently cut areas and therefore it is rare that insecticides are sprayed on berries. Because most of the chemical insecticides have preharvest intervals which vary with insecticide and crop, and because some insecticides are not registered for use on vegetation such as raspberries, MNR suggests that food not be consumed from areas treated with chemical insecticides in the year of application (Ex. 664, Response to Question 4). Dr. Campbell said he believed MNR was being "ultra-conservative" (trans: vol. 113, p. 19000).

Based on the evidence provided, we are ordering in Appendix 3, part D, section 1(c) that clear warning signs against eating berries in spray areas be posted in English, French and Ojicree, with the spray date and product used, the month and year berries may again be consumed, and the name and telephone number of an MNR contact person.

Public Complaints

FFT would have us require MNR to develop information on the "principal known and reasonably foreseeable health and environmental effects of herbicides" approved for use in Timber Management for a long list of subjects including the male and female reproductive health risks and the susceptibility of children. FFT brought no witnesses to testify on the human health and environmental impacts associated with exposure to forest herbicides. The evidence we heard is that MOEE has responsibility for the regulation of pesticide use in Ontario and the federal government, through Health and Welfare Canada and Agriculture Canada, has that responsibility nationwide. We find that MNR's responsibility is to ensure safe application of the herbicides used and to provide the public with the names of contact persons in MOEE or in other government agencies who are in a position to answer the public's enquiries and provide available written information on any health or environmental effects associated with the use of herbicides in forestry. Appendix 3 of our Conditions of Approval, which sets out the complicated notice requirements at different stages in timber management, calls for the names of appropriate contact people to be included in these notices (Appendix 3, part D, section 1(c) and Appendix 3, part F, section 1(e)).

FFT proposed more careful and detailed record keeping by MNR for workers using herbicides and for complaints from the public. MNR gave us evidence for 1980 to 1986 showing 25 injuries reported by workers from chemical spraying compared to 466 injuries from mechanical and manual tending (Ex. 622). MNR told us that from 1984-88 it received 93 documented complaints concerning pesticide use in the forest (Ex. 621). In Appendix 21, section 1(f) we order that records of worker use and complaints by the public about pesticides be systematically collected by MNR and be reported in the Plan. Even though the use of herbicides in our forest is small compared to the amount used in southern Ontario for agriculture and lawn care, we are persuaded that full disclosure of worker exposure and a thorough record of public complaints will provide a better basis for addressing public concerns in timber management planning.

The Forest Environment

MNR relied on a report prepared by ESSA Ltd., entitled "Environmental Effects of Pesticide Use for Timber Management in Ontario" (Ex. 604C). Peter Kingsbury, formerly environmental impact project leader at the Forest Pest Management Institute of Forestry Canada and an expert in the environmental effects of pesticides used for timber management, spoke to this evidence at the hearing.

Gordon Craig of Beak Consultants, qualified as an expert toxicologist with particular expertise in aquatic toxicology and toxic and hazard risk assessment and techniques, presented OFIA's evidence on the potential effects of pesticides on the terrestrial and aquatic environments (Ex. 1222).

No other party provided expert witnesses on the effects of pesticides, although both FFT and NAN cross-examined Mr. Kingsbury and Mr. Craig extensively.

The statements of evidence by ESSA Ltd. for MNR and by Beak Consultants Ltd. for OFIA each discussed the potential effects of five herbicides (glyphosate, 2,4-D, hexazinone, simazine and picloram) and four insecticides (B.t., aminocarb, carbaryl and fenitrothion).

Chemical Nature of Pesticides

The ESSA Report prefaced its discussion of environmental effects by describing the potential for residues of pesticides in soils, water, plants and animals. The residues expected after pesticide application depend on a variety of factors:

- (1) the application rate of the pesticide;
- (2) other application parameters, especially droplet size, and meteorological conditions during application; and
- (3) the chemical nature of the pesticide, particularly with respect to its:
 - persistence,
 - leachability,
 - bioaccumulation, bioconcentration and biomagnification potential.

Understanding the chemical nature of pesticides is the starting point of understanding their potential environmental effects. These various technical terms will be defined as they are considered below.

According to Mr. Craig of Beak Consultants, "persistence describes the rate of degradation of a compound in various media (water, soil, sediment) and is also used in reference to the retention of accumulated levels in exposed organisms" (Ex. 1222, p. 52).

The ESSA Report concludes that pesticides used for timber management in Ontario are overall not very persistent. Under most conditions, the half-lives (time in which the initial residues decline by 50%) range from minutes (in the air) to hours or days (in water or

animals) to weeks (in soil or vegetation). The exceptions for herbicides are: simazine, which has a half life of 3 to 12 months in soil; picloram, which ESSA describes as one of the more persistent herbicides in use in Ontario and probably more persistent than the other herbicides used for forestry; and residues of 2,4-D on berries. Exceptions for insecticides are measurable residues of the chemical insecticides carbaryl and fenitrothion in the waters and sediments of small shaded or acidic ponds as much as one year after spraying (Ex. 604C, p. 38). Mr. Kingsbury added that fenitrothion becomes tightly bound to the waxy surface of conifer needles, sometimes for years (trans: vol. 121, p. 20197).

Mr. Craig used the definition of the International Joint Commission to state that compounds are considered persistent if their half lives are greater than eight weeks. Given that criteria, his evidence was that, of the herbicides, only simazine and picloram are persistent. Mr. Craig's evidence supported that of the ESSA Report, that because picloram is applied only by injection in Ontario and is strongly retained by vegetation, the fate of picloram in soil, water and air is not of concern (Ex. 604C, p. 28 and Ex. 1222, p. 29). Mr. Craig testified that none of the insecticides could be considered persistent (Ex. 1222, p. 59). Because 2,4-D degrades by 50% within days or several weeks of application, Mr. Craig said multiple applications year after year would not cause a build-up in the environment.

As for the tendency for pesticides to move within the soils, the ESSA Report concludes that forestry pesticides have not shown any significant tendency to leach for reasons of low solubility, tight bonding with soil organic matter, photo-degradation and biodegradation. ESSA concludes that movement through soils is not expected to offer a significant pathway for the pesticides to either surface or ground waters (Ex. 604C, p. 38).

Another factor of the chemical nature of a pesticide is the potential for it to accumulate in animals. The ESSA Report described how pesticides applied from the air travel through various pathways to soil, water, groundwater, sediments, vegetation and animal tissue. Pesticides enter vegetation by application to foliage and by uptake from soils by roots. Pesticides accumulate in animals in several ways: through direct contact with their skin; through ingestion of contaminated plants, animals or water; by inhalation; or by preening. Bioaccumulation refers to the presence of measurable concentrations of residues in animals. Bioconcentration describes a situation where the concentration of a pesticide in an animal is greater than that in its environment. Biomagnification occurs where the concentration of a pesticide in an animal is greater than the concentration in the food it eats (Ex. 604C, p. 17).

The ESSA Report concluded that none of the pesticides considered has significant bioconcentration or biomagnification potential (Ex. 604C, p. 38). Mr. Kingsbury concluded

that where there is bioaccumulation of forestry pesticides, it is short-lived and the residues in terrestrial and aquatic animals decline within hours. He also argued that if biomagnification or bioconcentration of pesticides did occur, authorities would not approve registration of the material (trans: vol. 121, p. 20202).

Mr. Craig said that all of the herbicides are readily accumulated by living organisms, but at very low rates and at low concentrations (trans: vol. 211, p. 37874). He also testified that the insecticides readily degrade in the natural environment and result in low to immeasurable bioconcentration of these compounds in animals and plants (Ex. 1222, p. ix, pp. 53-59).

Mr. Craig testified that the environmental significance of the persistence of pesticides depends on the toxicity of environmental residues to organisms, meaning that even if a compound is persistent, it will only be environmentally hazardous if the exposure concentrations are higher than the organism's toxic threshold. The amount of residue in animals and plants depends on their ability to metabolize and eliminate these pesticides from their systems. We discuss the toxicity of these pesticides to plant and animal life in the following sections.

Plants and Soil

FFT Counsel Joseph Castrilli attempted through cross-examining on the 1975 and 1979 papers resulting from the Hubbard Brook Ecosystem Study in New England (Ex. 673 and Ex. 674) to suggest that herbicides suppress and eliminate competition and this causes nutrient loss, increased erosion and water yield and removes food for wildlife. Ms. Krishka responded that the Hubbard Brook case studies were not a study of normal forestry in northern Ontario but rather of an experimental area that was deforested and sprayed for three consecutive years to sterilize the soil (trans: vol. 115, pp. 19370-72). Ms. Krishka, Mr. Armson and Dr. Campbell all agree that herbicides have no long-term effect on woody vegetation because it grows back before the second or third season and re-growth occurs in the first year of application.

Mr. Kingsbury testified that herbicides are toxic to plants and generate the same type of temporary vegetative changes as other forest management activities. He concluded that herbicides are virtually non-toxic to invertebrates, such as soil fauna (trans: vol. 121, pp. 20245-46).

Mr. Craig said aquatic plants are only affected in their above water portions by herbicides. The subsurface portions are protected by dilution and he said any negative herbicide effects are minimal and transitory on aquatic plants (trans: vol. 211, p. 37888). MNR also argues that 2,4-D and glyphosate are registered for aquatic weed control, and, therefore, do not have unacceptable impacts on the aquatic environment.

Fish and Water

Mr. Kingsbury stated that herbicides used in timber management at approved rates of application are of very low toxicity to fish (trans: vol. 121, p. 20255; Ex. 604C, p. 80).

A herbicide is seldom sold for use as the pure chemical, but is usually mixed with several other ingredients which perform different functions, such as making it easier to mix into a spray and allowing spray droplets to spread out on leaf surfaces. The combination of pure chemical (called the active ingredient) plus these other ingredients (called inert ingredients) is referred to as the "product." Mr. Kingsbury testified that some commercial products include inert materials such as surfactants (which help to get the material onto and through the plant surface) and solvents (detergents), which can be more toxic than the pesticide itself. He said that this is true of the commercial formulation of glyphosate, Vision (trans: vol. 121, pp. 20255-56).

We heard extensive cross-examination of Dr. Ritter and Mr. Kingsbury by FFT on the issue of the toxicity of inert ingredients of pesticide products. Dr. Ritter acknowledged that human health testing deals only with the active ingredients and not the inert ingredients of pesticide products. Dr. Ritter explained that the large number of pesticide products (approximately 5,000 in Canada) precludes doing the intensive testing that is routinely required for the approximately 450 active ingredients (trans: vol. 123, p. 20591).

With respect to the commercial formulation of glyphosate, Vision, Mr. Kingsbury said that although the environmental fate and effects of the surfactant itself are not studied as part of the registration process, the product is studied under field conditions, at maximum application label rates with direct over-spray into water. Mr. Kingsbury concluded from this testing that for "the type of exposure we see with herbicide applications," the risks to fish are "minimal if not minuscule" (trans: vol. 121, p. 20257).

Mr. Craig stated that "significant direct toxic effects on fish are exceedingly unlikely to occur as a result of 2,4-D applications in timber management" (Ex. 1222, p. 39). Mr. Craig says herbicides are not particularly toxic to fish given the types of exposure concentrations to

which fish will be exposed. He also said that herbicides are diluted upon being mixed with water, and aquatic insects display drifting away from areas of toxic concentration. Mr. Craig describes how 2,4-D residues dissipate in water due to factors such as wind shear, thermal currents and flushing rates. He explained the dilution process with reference to the Weeks Study, which shows that glyphosate was non-detectable within four days following spraying in the water body. Where buffers were used, the decline occurred within two to three days (trans: vol. 218, p. 39474). Mr. Craig also gave evidence that the Weeks Study appears to have used a buffer of 20 metres but in Ontario a 60-metre buffer is required around water bodies (trans: vol. 218, p. 39574).

Mr. Craig and Mr. Scheifer concluded that for concentrations of herbicides to approach those reported by Weeks given the average size pond that occurs in Ontario, the depth of water in many instances would be too shallow to support many of the fish species listed in the Weeks study (trans: vol. 212, p. 38079).

With regard to the effects of insecticides on fish, Mr. Kingsbury said B.t. is not toxic to fish and has no impact on them. Mr. Kingsbury also said aminocarb, carbaryl and fenitrothion do not have lethal or significant sub-lethal effects at the rates they are normally applied. Mr. Kingsbury made the persuasive argument that the registration process requires studies on the effects of directly spraying these chemical insecticides on water. In addition, MOEE requires buffer zones of 60 to 240 metres wide for forestry purposes in areas considered significant or sensitive or near where people live. Mr. Kingsbury concludes that any drift into spray blocks would be much less than the direct spray itself which is proved in the registration process. Mr. Kingsbury concludes that "the pesticides registered for use in timber management have negligible or limited impact on ecologically critical aspects of sensitive non-target organism communities."

Mr. Kingsbury testified that carbaryl and fenitrothion last longer on small, dark acidic forest ponds, which could affect the growth rate of ducklings that rely on water insects, but he suggests this potential effect can be minimized or mitigated by avoiding spraying significant duck producing areas. Mr. Kingsbury testified that the application of fenitrothion and carbaryl on water bodies may cause modest effects ranging from insect drift to mortality of aquatic insects, but he said this effect is minimized by the application of buffer zones. Only part of the insect population is affected, and the overall population recovers within the season of application. Dr. Ritter said that aminocarb has less effect on aquatic invertebrates than either carbaryl or fenitrothion (trans: vol. 121, p. 20248).

Other Wildlife

Mr. Kingsbury's evidence is that herbicides have low toxicity for song birds and small mammals and these species are not likely to be found in recently harvested sites where herbicides would be used (trans: vol. 121, pp. 20250-51). Mr. Craig and another industry witness, Dr. Wilson Eedy, concluded that herbicides are not particularly toxic to animals and that their beneficial and adverse effects on wildlife food and habitat balance out (trans: vol. 211, pp. 37874-81).

FFT cross-examined Mr. Craig extensively on the Weeks study (Exhibit 1233) which is the U.S. Forest Service draft environmental impact statement on vegetation management in the Ozark/Ouachita Mountains, and which Mr. Craig relied upon in preparation of Ex. 1222 (trans: vol. 211, p. 37955). The Weeks study adopted an approach to assessing pesticide effects by using extreme dose estimates so that compensation could be made for uncertainty in the toxicity data base.

Mr. Craig stated that "there is currently no scientific evidence of which Beak is aware indicating significant adverse toxic effects to terrestrial animals as a result of 2,4-D use in timber management" (Ex. 1222, p. 32). In cross-examination, FFT referred Mr. Craig to a statement in the Weeks report that "herbicides may affect the red cockaded woodpecker directly" (Ex. 1233, p. 8-24). Mr. Craig said that the Weeks report is a risk assessment, which identifies that particular species as more at risk to the exposure scenarios, but said "we're still not aware of direct evidence that there are adverse toxic effects" (trans: vol. 211, pp. 38011-12). The red cockaded woodpecker is a threatened or endangered bird in the United States (Ex. 1233, p. 8-23) but it is not found in Ontario (Eedy, trans: vol. 211, p. 38014). Mr. Craig responded during this cross-examination that the study Beak undertook found "a reasonable factor of safety when we looked at the consumption levels required to produce responses, that with the broad enough species base we felt satisfied that there would be no impending adverse effects" (trans: vol. 211, p. 38016).

Mr. Kingsbury testified that B.t. has been found to have no direct impact and little evidence of indirect adverse effects on the food supply of bird populations. Mr. Kingsbury said evidence is lacking on the effects of fenitrothion, aminocarb and carbaryl on the overall populations or reproduction of song birds and small mammals. He conceded that there is evidence of a sub-lethal effect of temporary suppression of a brain enzyme in some species of song birds but its significance is uncertain.

In response to the concern raised in the mid-1970s by Dr. P.A. Pearce, who estimated that millions of song birds had been killed by forestry spray programs in New Brunswick, Mr. Kingsbury testified that newly published data by Dr. Pearce reports that 64 song birds have been found dead in fenitrothion sprayed areas in New Brunswick, Newfoundland and Maine from 1967 to 1987, with only three found dead since 1977. Mr. Kingsbury said that another chemical insecticide, phosphamidon, was responsible for more of the spray casualties, but he estimated that in that 20-year period there has been over 20 million hectares of fenitrothion spraying in those jurisdictions. He said those figures do not support the conclusion that there has been considerable mortality of song birds associated with fenitrothion spraying (trans: vol. 125, p. 21191 and p. 21210).

Mr. Kingsbury disputed a finding in the ESSA Report that suggests evidence of aminocarb and fenitrothion affecting small mammals and fenitrothion affecting amphibians. MNR accepts Mr. Kingsbury's interpretation that, with the exception of small song birds, evidence of these effects is lacking (MNR Final Argument, p. 414, and trans: vol. 125, p. 21167).

FFT had raised a concern that reptiles, amphibians and raptors have not been rigorously evaluated for effects of pesticides. Mr. Kingsbury said that, because all forest animals cannot be studied in depth, researchers select smaller species that are considered to be sensitive indicators of the potential impacts of pesticides, for example, mice and voles as indicators of effects on larger mammals (trans: vol. 121, pp. 20238-39). Mr. Kingsbury also said raptors have large breeding and feeding territory and are unlikely to be susceptible to direct or indirect effects, and raptor populations are assessed in a general sense through MNR's population monitoring program.

With respect to the effects of insecticides on non-target insects, Mr. Kingsbury concludes: B.t. will affect some non-target caterpillars but has little impact on bees or other invertebrates. Mr. Kingsbury concluded that the broad spectrum chemical insecticides such as aminocarb, carbaryl and fenitrothion will kill some non-target insects from sprayed trees, but this represents only a small portion of the resident invertebrates in the trees with no long-term impact on the population (trans: vol. 121, p. 20247).

Dr. Ritter said all of the chemical insecticides are fairly toxic to bees and can kill bees which are exposed to spray droplets. He also said that aminocarb has less effect on bees than either carbaryl or fenitrothion (trans: vol. 121, p. 20247).

Mr. Kingsbury said pollination of forest plants can be affected by insecticide spraying, but the overall biological system continues to work (i.e. not all bees are killed, and other pollinating insects compensate). Kingsbury's evidence is that the toxic effects of carbaryl on

colonies of honey bees and bumble bees has been reduced through a reformulation of the product by the manufacturer. It is now less likely that a foraging insect will transport the insecticide back to the hives. Mr. Kingsbury said that it is routine practice to spray earlier and later in the day when bees are unlikely to be foraging actively.

Moose Browse

OFIA submits that Dr. McCormack's studies at Austin Pond demonstrate that the effect of herbicides on moose browse is a short-term reduction, but over the long term the condition of browse material was of higher quality on sprayed blocks. It says herbicides will not affect the long term habitat requirements of wildlife nor their population size (trans: vol. 206, pp. 36765-67).

Exhibit 722 is the Newton 1989 study on deer-browse availability following herbicide spraying, which suggests that nine years after glyphosate spraying, browse is much better in the sprayed than unsprayed areas. Newton had two conclusions: none of the herbicides eradicated any plant species, and tall cover was reduced but not eliminated.

Exhibit 771(b) is a 1988 study on the effect of winter utilization by moose of glyphosate treated cutovers near Thunder Bay. Mr. Kingsbury concluded from this study that moose in Ontario are not limited by browse availability (trans: vol. 131, pp. 22176-77). A 1990 update of this study was submitted as Exhibit 1182. The study authors raise a concern for winter mortality and declining population as a result of aerial applications of glyphosate creating large contiguous areas with reduced availability of seasonal moose forage. MNR acknowledges that more research is necessary on the long-term effects of glyphosate treatments on use of treated areas by moose and deer (MNR Response to Board Interrogatory 135).

MNR responded to the OMAA witnesses Harold Michon, Patrick McGuire and Stanley Simmons, who complained about diseased moose, that the cysts they described in the liver of moose sounded like cysts of tapeworms, and were in no apparent way related to timber management practices (Ex. 1999, p. 1). In response to Mr. Michon's statement that he noticed a decrease in size and body fat on the moose from those areas sprayed with herbicides, MNR said that "the cause of reduced fat content and size in such circumstances would relate to lack of available vegetation, and would not be a direct result of or reaction to the herbicide itself" (Ex. 1999, p. 4). MNR also said that it would be surprising if moose in a sprayed area did not move to adjacent unsprayed areas. They concluded that there is no logical expected direct effect of spraying and/or clearcutting on increasing occurrence

of infectious and parasitic diseases, except to the extent that timber management activities may enhance the killing rate of infected moose by wolves, and further disseminate parasites through the wolves (Ex. 1999, p. 4).

Public Concerns

Counsel for OFIA urged us to find that there was no "groundswell" of public support throughout the hearing for a ban on herbicide spraying, and said the industry could only find two such submissions from the satellite hearings (trans: vol. 400, p. 68540). OFIA seems to have overlooked many expressions of public concern at the hearing. In FFT's oral argument, counsel referred to six individuals who expressed their opposition to the effects of herbicides (trans: vol. 401, pp. 68798-99). Those six submissions and many others we received concerning pesticides generally are summarized in the following.

We received complaints about herbicide spraying from Greg Hlady, who represented the group People Interested in a Natural Environment (PINE) at the Fort Francis (trans: vol. 204) and Sioux Lookout (trans: vol. 329) community hearings.

We heard from John Rice about an isolated spraying incident that occurred 15 years ago, in which a significant number of conifers were killed as a result of improper mixing of chemicals (trans: vol. 329, p. 57814). Stephen Gregory expressed concern about the health risks of herbicides, and referred to a new study from the National Cancer Institute in Washington linking cancer in dogs to exposure to 2,4-D spraying on lawns. Mr. Gregory argued that government agencies say that chemicals are safe when used according to guidelines, but in his opinion, there have been many documented cases where chemicals have not been used in accordance with such guidelines. As an example, Mr. Gregory described an incident at Sioux Lookout in June 1991 where herbicides were over-sprayed into nearby subdivisions (trans: vol. 329, p. 57983-84).

Sylvio St-Jules, of the Hearst Trappers Council, recommended that aerial spraying operations be more carefully supervised to prevent spraying waterways (trans: vol. 235, p. 42845). Steven Taylor of the Voyageur Trail Association was also concerned about pesticide drift into buffer areas (trans: vol. 229, p. 41704). Robert Cote and Edgar Lavoie of the Beardmore-Lake Nipigon Watch Dog Group appeared at the Geraldton community hearing and gave examples using photos and a video to support their conclusion that conifers are damaged from herbicide spraying (trans: vol. 238, p. 43128).

Several witnesses from different locals of the Canadian Paperworkers Union appeared before us to talk about herbicide spraying. Warren Mazurski of the CPU submitted that "herbicides affect all the other parts of the forest ecosystem with potentially devastating consequences" (trans: vol. 322, p. 57002). Bob Lavallee of the CPU said that local foresters told him that the entire Limestone Lake area, about 15 miles north of Nipigon on Highway 11, near Thunder Bay, has already been chemically treated two or three times to try to keep the poplar down so the spruce can grow and thinks that they are going to need more in the future - maybe every two or three years. He voiced concerns about the long-term effects of herbicides on animals, water and soil (trans: vol. 322, p. 57008). Cecil Makowski, Ian Radforth and Thomas Dunk representing the CPU recommended that "the board direct the proponent to continue the reduction already under way so that herbicides can be eliminated in forest management" (trans: vol. 379, p. 65666).

Mr. Dunk of the CPU described his survey of 45 experienced forest workers in northwestern Ontario, and his finding that "the things that were most important or most frequently discussed by the people I interviewed were things like the use of herbicides or chemical spraying in terms of forest regeneration, and what they were concerned about was what they perceived to be the effect of the chemical spray" (trans: vol. 379, pp. 65728-29). Mr. Dunk said that many of the forest workers told him that they did not believe what they had been told, that the effect of chemical spray would be to retard the growth of broad-leaf trees for two years to allow the young conifers to grow. Many of these forest workers said that they could show him areas that had been sprayed five to seven years earlier where broad-leaf trees had never returned, or to formerly good moose hunting territories where the moose had never come back. Mr. Dunk said the forest workers were also concerned about the long-term effects that the spraying would have in terms of the kinds of toxins that might be in berries, and some were concerned about the immediate effects of spraying on their own health (trans: vol. 379, pp. 65728-30).

John Craig, of the Noelville District Rod and Gun Club, told us this group is concerned with the use of chemical insecticides and herbicides. He said that each year the club receives several complaints following spray programs regarding the discovery of dead rabbits (trans: vol. 232, p. 42329). Thomas Baxter expressed his concern for the effects of pesticides on birds (trans: vol. 323, p. 57065).

Charlie Smith, a farmer and guide, stated that he can't agree with the poisoning of the young hardwoods, poplar and berry bushes with herbicides (trans: vol. 232, p. 42247). John Steinke, a guide, said:

I have heard all of the testimonials and propaganda expressed by those participants. None of them would take a stroll through their devastated area after they sprayed it. I tried to a week later when they stated it was safe. My dog couldn't have survived if I didn't carry it around. Most notable is the total lack of wildlife; there isn't a bee, there isn't a bird, there is nothing there. It seems that this isn't important to herbicide specialists. For years the results show up and no one but us has to deal with the damage to the environment.

(trans: vol. 204, p. 36268)

Larry Reeve, of the Timmins Fur Council, told us that the very best bush type for the production and habitat of wildlife is a blend of many types of trees. He said that spraying in sandy areas or areas where deciduous trees don't grow well is very effective and by wiping out the vegetation it reduces the wildlife populations in those areas. He also said that spraying close to water kills the deciduous trees and eliminates the food supply for the beaver populations. He said that spraying late in summer, as had happened that year, was too late for the beavers to pack up and move to another location. He suggested that spraying in the spring might reduce the impact on the beaver populations (trans: vol. 234, p. 42649).

Howard Hampton, MPP for Rainy River, told us of the concerns of his constituency over herbicide spraying (trans: vol. 205, pp. 36419-20). The Hon. Mr. Hampton is now Minister of Natural Resources.

Jack Hedman, of the Fort Frances Sportsmen's Club, told us how he had worked for Ontario Hydro spraying defoliants under transmission lines, and described his concerns for worker safety in applying herbicides (trans: vol. 205, Ex. 1178, Ex. 1179). Mr. Hedman also submitted a study conducted north of Thunder Bay that described negative effects of herbicide application on moose browse (Ex. 1182).

Yvonne Kerr, of the Bridgeland Cottagers Association, complained about herbicide use near her cottage:

When these pines reach perhaps four or five years I think they must sneak in in the dark at night with sprayers and suddenly all the other plants in the area die. We are warned not to eat the berries and the blueberries that year, but for years afterward not a berry, not a blueberry, not a squirrel or a chipmunk, nothing appears where this spraying came quietly into the night.

(trans: vol. 229, p. 41694)

We heard from NAN elders including Isaac Beardy, who is concerned about the effects of spraying on wildlife, the food chain and human health, and Kerry Lastheels, who worries about the effects of chemical spraying on wildlife and children and feels that spraying blueberries will poison her people (trans: vol. 330).

Mary Laronde, of the Teme-Augama Anishabai First Nation, described concern with the removal of berries and plants for medicines through herbicide use. She stated that the liver of moose is now spongy and mushy and they want to know if this could be due to the moose eating plants which have been sprayed with chemicals (trans: vol. 366, p. 63741).

Mr. Michon, Mr. McGuire and Mr. Simmons for OMAA told us that each of them has caught at least one moose that had a large or diseased liver or other obvious disease, and that they notice a decrease in size and body fat on the moose from sprayed areas. They told us that they thought that spraying or some aspect of timber management was doing this (trans: vol. 327, p. 57666). As discussed on p. 274, MNR's response is that the problem is tapeworm, not spraying.

We heard support for chemical herbicides from several witnesses and organizations, including the Coalition's statement that it does not object to the safe and efficient use of timber management tools for tending and protection, and a similar statement from the Canadian Institute of Forestry (trans: vol. 333, p. 58385). Geoffery Meakin (trans: vol. 229, p. 41720) and Curtis Pinkerton (trans: vol. 335, p. 58808) also support the use of herbicides in timber management.

Exhibit 621 is a summary of documented complaints received by MNR districts with respect to pesticide use in forest management from 1984-1988. Peter Galloway, one of the authors of the summary, said that the total of 93 documented complaints for the period 1984-1988 is low. He explained that the summary contained only those serious concerns that were documented, and that the many calls and short letters that were answered by MNR more quickly would not be included in the total (trans: vol. 109, pp. 18165-67).

MNR infers that public opposition to spraying is small compared to the example of 1985 open houses in which 85% of the public attending the open house and 100% of the Northern Ontario Chambers of Commerce supported a policy which would allow the use of chemical insecticides (trans: vol. 303, pp. 53884-85).

In MNR Reply evidence, Dr. Wagner described to us efforts to provide more information to the public about pesticides, as one component of the education program of the Vegetation Management Alternatives Program (VMAP). Dr. Wagner said that one of the

projects under way is a literature review of public opinion about the use of herbicides in America and Europe, and a survey of what Ontario citizens think about vegetation management. He hopes that MNR will then be able to "do a much better job educating the general public on what we do and why we do it, which historically, I think, many would agree the forestry profession has not done a very thorough job" (trans: vol. 391, p. 67306). Dr. Wagner told us that MNR is now using TV, radio and newspaper advertising as part of its public education program on vegetation management alternatives (trans: vol. 391, p. 67311).

Findings

We carefully considered the extensive evidence we received on the potential effects for human health and the environment associated with the forestry use of chemical pesticides. The evidence supporting the safe use of chemical herbicides and insecticides was submitted by MNR and the forestry industry; opponents to the use of forestry chemicals produced no expert witnesses or written evidence to support their position.

We conclude there is no reliable evidence before us establishing that the use of chemical pesticides in timber management poses any significant or unacceptable risk to public health. Our conclusion in no way overlooks or diminishes the on-going concerns the public expressed to us about chemical spraying.

We conclude with respect to the potential environmental effects that pesticides authorized for use in forestry in Ontario do not pose risk of unacceptable environmental disturbance and that the public is entitled to rely on pesticides registration as evidence that chemical herbicides and insecticides are safe if used properly.

CHAPTER 8

HOW CAN WE TELL IF TIMBER MANAGEMENT PLANNING IS PROTECTING THE FOREST?

INTRODUCTION

Our conclusion from the scientific evidence and expert opinion we heard is that timber management is likely to work successfully to protect the forest while supplying timber to industry. Actual proof of this success can only be found in MNR's performance and the state of the forest in the years to come. For this reason we cannot approve the undertaking of timber management planning without anticipating and dealing with its consequences. Our Conditions of Approval set up a system of tracking, scrutinizing, assessing and studying timber management planning. We call this the monitoring system and in our view, so long as timber management planning is carried out in Ontario, it must be monitored. We are convinced that the potential adverse impacts of timber management planning are predictable and then amenable to being prevented or mitigated. Still, the uncertainty inherent in human tampering with the huge forests of northern Ontario, rapid changes in the science of forestry and our Conditions of Approval requiring MNR to investigate the feasibility of new approaches to forestry all suggest the implementation of timber management planning must be watched carefully, corrected where problems arise and improved whenever possible.

We are approving an overall management approach in which MNR uses implementation manuals, consisting of three types of written directions to field staff for planning and carrying out timber operations: provincial guidelines, construction/operational manuals and resource/environmental manuals. The overall focus of monitoring is on the proper use of the implementation manuals. An important consideration in this management approach is finding a good balance between requiring adherence to the rules in the implementation manuals while at the same time allowing foresters and other specialists to use their professional judgement in making decisions that best protect the forest environment.

The first type of monitoring our approval requires is called compliance monitoring. This is designed to ensure that MNR and the forest industry carry out timber operations in conformity with the Plans and operational standards. Compliance monitoring is the process by which the performance of MNR and the industry will be judged, primarily on the basis of yearly area inspections and every five years through independent audits. In short, as Dr.

Jack Ward Thomas described it, compliance monitoring means "you go out and check to see if you did what you were supposed to do" (trans: vol. 354, p. 61675).

The second type of monitoring is aimed at assessing the effects of timber management operations and the effectiveness of timber management prescriptions and practices on protecting non-timber environmental values. We are ordering conditions that will monitor the immediate local effects on a yearly basis. We are also ordering large-scale, multi-year research studies on the effectiveness of the guidelines for moose habitat, fish habitat and tourism as well as wildlife populations.

The third type of monitoring we are ordering is for silvicultural effectiveness. If MNR is unsuccessful in its silviculture efforts involving harvest, renewal and maintenance, then timber management planning will have failed. Monitoring of silvicultural effectiveness involves collecting and analyzing information and reporting on the progress achieved in regenerating the forest.

Common to all the monitoring programs we are establishing is a public reporting system using the Report of Past Forest Operations, the Annual Reports for the management unit and to the Legislature and the five-year State of the Forest Report. Rather than repeat these requirements for discussion of each of the three levels of monitoring, the Conditions of Approval describing the content of these four documents are presented at the conclusion of this chapter.

MANAGEMENT BY IMPLEMENTATION MANUALS: THE GUIDELINE APPROACH

Description of the Management Approach

With this approval we provide MNR with a reasonable level of management flexibility that we are persuaded can best be achieved through the use of implementation manuals, which has been described as the guidelines approach. We agree with MNR that timber management activities:

... take place over a wide geographic area, in a dynamic and complex environment. The potential effects of these activities, though generally similar, can have aspects that are site specific. It is neither possible nor desirable to attempt to predict and list all potential effects and then to formulate rules to

govern every possible combination of circumstances. For this reason, MNR employs professional and technical staff to make site specific decisions.

(MNR Final Argument, p. 841)

MNR's "guideline" approach to management attempts to ensure compliance with the law and policy governing this undertaking while recognizing that timber management is not an activity that can nor should be so rigorously prescribed by this approval as to displace practitioners' judgement and knowledge. Sound judgement by MNR staff in making timber management planning decisions is something we are relying on to ensure satisfactory pursuit of this undertaking.

Simply put, implementation manuals are a tool used by MNR to direct and guide professional and technical staff. They are the primary mechanism through which operational standards for timber management activities are provided. There are three broad categories of implementation manuals. These are specified in Condition 20(b) and Appendix 7 and described as follows.

Provincial Guidelines

The provincial guidelines consist of six silvicultural guides, including one we are ordering for mixed wood stands, and eight timber management guidelines.

Silvicultural Guides

- A Silvicultural Guide to the Jack Pine Working Group in Ontario, 1986
- A Silvicultural Guide to the Spruce Working Group, 1988
- A Silvicultural Guide to the Poplar Working Group, 1989
- A Silvicultural Guide for the Tolerant Hardwoods Working Group in Ontario, 1990
- A Silvicultural Guide for the White Pine and Red Pine Working Group in Ontario, 1990
- A Silvicultural Guide for Mixed Wood Stands (pursuant to Condition 94(d))

Timber Management Guidelines

- Timber Management Guidelines for the Protection of Tourism Values, 1986
- Timber Management Guidelines for the Provision of Moose Habitat, 1988
- Timber Management Guidelines for the Protection of Fish Habitat, 1988
- Timber Management Guidelines for the Provision of White-tailed Deer Habitat (in preparation)
- Timber Management Guidelines for the Protection of Cultural Heritage Resources, 1991
- Timber Management Guidelines for the Provision of Pine Marten Habitat (pursuant to Condition 94(c))
- Timber Management Guidelines for the Provision of Pileated Woodpecker Habitat (pursuant to Condition 94(c))
- Environmental Guidelines for Timber Management Activities (pursuant to Condition 94(b))

The six silvicultural guides listed above are specifically directed to ensuring that timber management operations are carried out on the basis of sound silvicultural prescriptions.

The provincial guidelines listed above identify a range of possible techniques or methods by which potential negative effects can be prevented, minimized or mitigated. In some cases, such as for moose habitat, use of the guidelines may improve the conditions for specific non-timber values. Other guidelines address how non-timber resource values are to be taken into account during the planning and implementation of timber management. These guidelines assist resource managers in determining how timber management activities can help to achieve non-timber objectives as well.

Construction/Operational Manuals

Construction and operational manuals are a set of five documents that assist resource managers to meet environmentally sound construction and operating standards.

- Aerial Spraying for Forest Management - an Operational Manual, 1981 (Note: applies to MNR only)

- Resource Access Roads Policy and Implementation Strategies and Guidelines, 1985
- Prescribed Burn Planning Manual, 1988
- Environmental Guidelines for Access Roads and Water Crossings, 1988
- Code of Practice for Timber Management Operations in Riparian Areas, 1991

These manuals include standards and provide direction on how to prevent, minimize or mitigate potential adverse environmental effects of timber management operations. For example, as we discussed in Chapter 4, the Environmental Guidelines for Access Roads and Water Crossings set out mandatory standards and information on "good practices" in relation to the construction of access roads and water crossings (Ex. 683). In addition, by Condition 76 we are ordering changes to the Code of Practice for Timber Management Operations in Riparian Areas in order to deal with concerns of trappers and canoeists as described in Chapter 9 (p. 340).

Resource/Environmental Manuals

Fourteen resource/environmental manuals are used in the development of timber management strategies and prescriptions for specific values that may be at risk from timber operations or are part of featured species management.

- Management Guidelines and Recommendations for Osprey in Ontario, June 1983
- Habitat Management for Ontario's Forest Nesting Accipiters, Buteos, and Eagles, March 1984
- Habitat Management Guidelines for Cavity Nesting Birds in Ontario, March 1984
- Management Guidelines for the Protection of Heronries in Ontario, 1984
- Habitat Management Guidelines for Warblers of Ontario's Northern Coniferous Forests, Mixed Forests or Southern Hardwood Forests, March 1984
- Habitat Management Guidelines for Bats of Ontario, August 1984
- Habitat Management Guidelines for Birds of Ontario Wetlands including Marshes, Swamps, and Fens or Bogs of various types (excluding waterfowl), March 1985
- Bald Eagle Habitat Management Guidelines, June 1987

- Golden Eagle Habitat Management Guidelines, November 1987
- Peregrine Falcon Habitat Management Guidelines, December 1987
- Guidelines for Providing Furbearer Habitat in Timber Management (in preparation)
- Habitat Management Guidelines for Woodland Caribou (in preparation)
- Habitat Management Guidelines for Waterfowl in Ontario (in preparation)
- Hawk Guide for MNR Field Personnel, 1991

Use of Implementation Manuals

The purpose of management by "guidelines" is to direct and guide MNR and the industry's foresters and other professional and technical management staff in carrying out timber management planning. MNR staff share a collective responsibility for timber management planning and operations. They must make decisions on many matters ranging from small-scale tree stands to the larger management unit level and also for the province as a whole. Without some effective means of direction and guidance, staff decisions could be inconsistent and unaccountable. Implementation manuals serve this purpose while at the same time giving MNR the ability to change and to improve its management procedures. The implementation manual approach also enables staff to deal with both exceptional and normal circumstances with conscientious and diligent professionalism and good judgement.

The question of whether implementation manuals have a mandatory application was debated by the parties. Although they are a flexible instrument, Condition 20(c) makes their use mandatory. District Managers must certify that Plans are prepared in accordance with the appropriate implementation manuals (Condition 61(c)). Only prescriptions exceptional to those found in the manuals must be specifically reported and explained in such a certification. This condition will apply provincially co-ordinated policy throughout the Area of the Undertaking. It will also identify where exceptions are being made to the "rules" or directions found in the implementation manuals.

The implementation manuals give a range of acceptable operational alternatives in normal circumstances. Where exceptions to the norm are encountered, the foresters can modify prescriptions within the limits of this approval but must report where they do so. The Area of Concern planning process will apply to any circumstance deviating from normal operations as set out in the implementation manuals (Condition 42). The AOC process

specifies how alternative prescriptions have to be considered. And as described above, the District Manager must certify these exceptions in the Plan.

We believe that management by implementation manuals provides adequate consideration of alternative methods at the local level. Recourse to the issue resolution process, as provided in Condition 64 and discussed in Chapter 3, will act as a safety net if the process falls short of providing for good environmental planning. We reject the Coalition's criticism that this approach generally fails to meet the requirements of good environmental planning for, among other things, failing to require a satisfactory alternative methods analysis (trans: vol. 405, pp. 69308-10).

Improving the Implementation Manuals

Implementation manuals are intended to provide a source of current relevant scientific information. The manuals must be regularly reviewed and updated by qualified people.

A review of each implementation manual will be done at least every five years, to determine the need for changing the existing manuals or preparing new manuals. A standing Provincial Technical Committee, made up of both government and non-government members, with professional and technical expertise in resource management and familiarity with the technical aspects of timber management, will do the reviews. The task of this committee is to keep implementation manuals current with new scientific knowledge and advances in analytical and operational technology.

Condition 89, providing for a Provincial Technical Committee, was substantially agreed to by the parties (Ex. 2301). FFT persuaded us of the merit of extending membership on this committee beyond strictly technical and scientific experts. During this hearing we were impressed by the submissions of many interested and knowledgeable lay people whose involvement in the deliberations of the Provincial Technical Committee, we believe, would open up MNR's management process at the crucial stage of developing direction and guidance to its timber management staff. It may not always be possible to find such individuals to serve, however, and for this reason we have stopped short of accepting FFT's entire proposal which would make such membership mandatory. For these reasons, we have provided for the inclusion of members of the public on the committee.

- 89. MNR shall establish the Provincial Technical Committee for Timber Management as a standing committee comprised of both government and non-government members. The purposes of the Committee are to ensure that implementation manuals are kept current in light of applicable scientific knowledge and advances**

in analytical and operational technology, and to set priorities for work on existing or new implementation manuals. The committee may include members of the public as well as persons with professional and technical resource management expertise and familiarity with the technical aspects of timber management. (See Condition 4(a)(iii) and Appendix 1, part B).

93. (a) Within five years of this approval, and thereafter at least every five years, MNR shall review each implementation manual to determine the need for revision or amalgamation of the existing manuals or preparation of any new manuals. The Provincial Technical Committee shall have an integral role in the review of existing implementation manuals, and the setting of priorities for revision or amalgamation of the existing manuals or preparation of any new manuals which may be required from time to time.
- (b) Any revision or amalgamation of the existing implementation manuals, or preparation of any new manuals shall be undertaken by suitably qualified persons.
- (c) The intent of the review of the manuals is to ensure that they reflect current scientific knowledge as it applies to Ontario. In considering the need for revisions, amalgamations or new manuals, in setting priorities, and in determining the appropriate contents of the manuals, the following factors shall be considered:
- i) the results of applicable scientific research;
 - ii) the results of monitoring programs described in Conditions 55, and 78-84;
 - iii) the advantages and disadvantages of changes to current timber management practices; and
 - iv) advances in analytical and operational technology.
- (d) Where existing manuals are revised or amalgamated, or new manuals are prepared, draft manuals shall be subject to review by appropriate government ministries and agencies, known provincial organizations and associations with expertise in the subject matter, and representatives of Local Citizens Committees prior to finalization and approval by MNR.

The Provincial Technical Committee will revise, amalgamate or develop new implementation manuals (MNR Condition 93(c)(ii)). Implementation manuals will be reviewed by the Committee every five years, and this allows the results of the provincial monitoring studies to be incorporated in the implementation manuals as they become available (Conditions 30, 81 and 93(c)(ii)). In addition, the committee will consider the results of the area inspection program (Conditions 55(a) and 78), silvicultural effectiveness

monitoring results, and "exceptions" to the recommendations in the silvicultural guides or any other implementation manual (Conditions 55(b)-(c), 26(b) and 42(c)).

The review of the existing silvicultural guides, and changing them to include descriptions of "general standard site types" for use in developing Silvicultural Ground Rules in timber management plans, will be accomplished in a three-year time frame (Condition 94(a)). MNR witness Frank Kennedy during Reply evidence explained that staff are now in place and this review is already under way (trans: vol. 393, pp. 67666-67). The use of general standard site types for silvicultural effectiveness monitoring is discussed in detail later in this chapter.

Intervenors' Criticisms

The OFAH/NOTOA Coalition criticized MNR's implementation manual management approach as being too focused on "constraints" to the production of timber instead of more positively identifying objectives for other forest values. It was argued that "constraints management" is unable to respond adequately to the need to provide a progressively more integrated management approach, and more important, unable to set and meet objectives for non-timber values.

The other major intervenors were in favour of the implementation manual approach to management. FFT, however, reserved the criticism that the manuals require substantial change in order to conform with FFT proposals.

Management by Constraints versus by Objectives

The intervenors' criticism of MNR's management by implementation manuals is that non-timber values are dealt with mostly by constraining timber operations. This means that MNR sets objectives for timber, and the protection of non-timber values is accommodated by limiting timber production.

While other resource values must be protected, in our view, and we discussed this on p. 98 in Chapter 3, it is wrong to conclude that all other competing resource values must or even can be quantified and addressed in Timber Management Plans as discrete "objectives" for production, in the same way that objectives will be provided for levels of timber production. Non-timber values will be protected and where possible enhanced. This will be accomplished through constraints on timber production as required through the various implementation manuals. To suggest, as the Coalition does, that management by setting

objectives should apply to all forest values overlooks the nature of our approval. We note, however, that Condition 23(c), as discussed in Chapter 3, encourages MNR to set objectives for non-timber values at the management unit level where it is necessary to protect a value or it is possible to address a local problem by doing so.

Also it is clear to us that today there is insufficient information about the cause and effect linkages between specific wildlife habitat and population levels in Ontario to move into management for quantified wildlife habitat objectives as basic minimum requirements in timber management planning. We have said repeatedly in this decision that a more integrated approach to resource management is laudable and we encourage it. But it is not something that can be rushed prematurely into place as the Coalition's proposals would have us do. We believe that the mere quantification of one forest value (i.e. timber) gives it neither priority nor elevates it in importance over the others for which we are providing protection. We disagree that the key to elevating other values is to set "objectives" for them. The *Environmental Assessment Act* provides for the equal protection of all forest values and we believe that non-timber values share equally the protection of the Act with timber. Simply setting targets as objectives for some or one of them does not change this.

Certainly Dean Gordon Baskerville indicated that he did not recommend wholesale change in MNR's current management approach. After describing his preference for a management process using quantitative predictive models more frequently than MNR does now, Dr. Baskerville stated he would not replace the guidelines approach immediately.

MNR has indicated its appreciation of the need to move towards integrated resource management generally and as we discuss in Chapter 11, Condition 107 prevents MNR from backsliding on this commitment. We also note that this commitment extends to the continuing review, development and improvement of implementation manuals.

Environmental Guidelines

The intervenors submitted there are deficiencies in MNR's implementation manuals, among them is the need for "environmental" guidelines governing timber management activities. For example, the Coalition raised concerns about site compaction and rutting, and MOEE and FFT raised concerns about the use of full-tree harvesting.

MNR proposed developing a new implementation manual to improve the protection of the physical environment from harvest, renewal and maintenance operations, particularly the nutrient and compaction concerns associated with site productivity, and directing harvest

layout and configuration (Ex. 2272, Ex. 2273B, Ex. 2258 and Ex. 2032). This new manual will provide additional information and guidance to those involved in timber management so that at the management unit level, issues involving knowledge of local site and forest conditions will be addressed consistently. MNR's proposal falls short of endorsing the need for an implementation manual that will address "environmental" concerns generally as the intervenors proposed. We agree with MNR that such a broad and general direction would be vague and unworkable. We are persuaded, however, that the new implementation manual proposed by MNR is needed to address protection of specific aspects of the physical environment during timber management operations. In Chapter 5 we give our views on how the new environmental guidelines will implement Condition 27 concerning a range of clearcut sizes up to 260 hectares, direct harvest layout and also address site degradation and nutrient loss. MNR proposes that the new manual will be developed in consultation with experts and interested persons over a 14 to 16 month period following completion of this hearing (Ex. 2258 and Ex. 2259).

Implementation manuals are used to provide staff working in the field with practical information and direction for specific values and aspects of the environment. Given that MNR's total management effort, including all implementation manuals, must conform to the standards of good environmental planning, FFT's proposal to develop an implementation manual in relation to "protection of the environment" generally is redundant where adequate protection for specific values and concerns are already considered in existing manuals. We believe that this standard will be met in MNR's new environmental guidelines and we order the development of these guidelines in Condition 94(b).

THE MONITORING SYSTEM

Compliance Monitoring

Definition and Background

MNR's responsibility to monitor compliance stems from its statutory mandate under both the *Crown Timber Act* (R.S.O. 1990, c. C.51) and the *Environmental Assessment Act* (R.S.O. 1990, c. E.18). A compliance monitoring regime is essential to this undertaking because without it, MNR can have no knowledge of how carefully, correctly or successfully Timber Management Plans are being developed and implemented.

"Compliance monitoring" was accurately described by MNR (Ex. 915, p.27) as a: "set of activities designed to ensure that timber management operations are carried out in conformity with timber management plans and operational standards."

The proponent carries out both "formal" compliance monitoring (i.e. field inspections, audits, contract administration and annual reporting) and "informal" compliance monitoring (i.e. training and education, supervision, public reporting). The existence of a regular programme of monitoring or inspection of timber management activities is an essential mechanism with which to promote compliance with any conditions placed on timber management activities.

Is Non-Compliance a Problem?

We have asked ourselves whether non-compliance with directions contained in approved Timber Management Plans is a problem. Is there evidence that non-compliance is significant? What level of compliance with approved timber management plans is acceptable?

The intervenors submit that MNR's monitoring proposals fall short of establishing a comprehensive and effective compliance monitoring system that can identify, document, and remedy instances of non-compliance.

We heard evidence from MNR, FFT and others documenting incidents where forest companies failed to comply with applicable provisions of statutes, regulations, Timber Management Plans and operational standards provided in implementation manuals. These incidents have occurred throughout the Area of the Undertaking in FMAs, Crown and company management units, and provincial parks. MNR provided documentation on incidents including a variety of infractions, such as unauthorized harvests of Crown timber, wasteful practices such as leaving high stumps and merchantable timber after logging, trespasses into reserves, and construction of unauthorized watercrossings in Lake Superior Provincial Park (Ex. 949) and in the Latchford Crown Management Unit (Ex. 950). We discuss the issue of wasteful practices in Chapter 5, p. 187.

FFT submitted a long list of examples of actual non-compliance recorded in MNR's evidence and alleged non-compliance observed by members of the public (Ex. 1433A and Ex. 1435). Some of these incidents included wasteful practices, unauthorized construction, unauthorized or excessive logging, erosion and sedimentation, overspray and drift of herbicides and construction of skidder trails into shoreline reserves.

FFT's list ranges from relatively minor to highly significant infractions. FFT asks us to infer that non-compliance is a greater problem than is reflected in MNR statistics since MNR's observance of non-compliance cannot be exhaustive. We have no evidence that MNR is always aware of all incidents of non-compliance. MNR, however, countered in its Reply evidence (Ex. 2258, p. 15) that compliance is at a high level. MNR claims that its survey of four randomly selected Districts in 1991-92 revealed a 15% non-compliance rate in the districts of Sioux Lookout, Atikokan, Timmins and Wawa and we discuss this further below.

FFT witness Mr. Mark Robinson expressed concern about non-compliance with an approved Timber Management Plan in the Blind River District (Ex. 1480). Richard Lindgren, counsel for FFT, characterized MNR's initial response to Mr. Robinson as indicating that there was a non-compliance rate of over 40% for 1990-91 (Ex. 1480A).

MNR's Position on Non-Compliance

We were subsequently informed by MNR that the actual non-compliance rate for this Plan was 30% in 1990-91 and 14% in 1991-92. Blind River District reported 86% compliance, 10% minor non-compliance and 4% significant non-compliance for year-end 1991/92 (Ex. 2251B). This was an improvement over the previous year 1990/91, when Blind River District reported 70% compliance, 22% minor non-compliance and 8% significant non-compliance by year-end (Ex. 1480A). Mr. Bill Lannin, District Manager for Blind River, provided three reasons to explain the discrepancy in the non-compliance statistics. First, the area inspections, which are described in the following section, are used to collect information about compliance with various pieces of legislation, the conditions in work permits, and other matters and, therefore, the information on the over 40% non-compliance rate concerning Mr. Robinson did not necessarily all relate solely to compliance with the Timber Management Plan (Ex. 1480B). Second, it is also important to note that in 1990-91 the Blind River District was instituting a new boundary-marking policy requiring the forest industry to do more of the marking itself, which resulted in the recording of an unusually high number of infractions (Ex. 2319). Third and most important, instances of apparent non-compliance recorded in area inspections done early during a timber operation may be corrected before the operation is completed, bringing it into compliance by year-end. This is one of the major benefits of ongoing "in-year" inspections.

In addition, a simple table comparing the number of inspections to the number of records of non-compliance and arriving at the percentage of non-compliance does not give any indication of the nature of the problem. Additional information would be needed to assess if the "non-compliance" were minor or significant. The actual area inspection reports will

provide detailed information concerning the specifics of non-compliance encountered at the time of the inspection (Ex. 2251B).

In contrast to FFT's evidence, as we referred to above, MNR provided a review of area inspection reports for four randomly selected districts in order to give some indication of the general level of compliance taking place in 1991/92. This review showed that, in these four districts, roughly 85% of the area inspections reported compliance, with about 10% showing minor non-compliance and about 5% showing significant non-compliance in that year (Ex. 2258 pp. 15-16). MNR describes these reporting results as showing a high degree of compliance.

We find overall that most operators attempt to comply with the requirements of Timber Management Plans and of their licenses. Many of the infractions noted during inspections were minor in nature. MNR produced additional information about the types of infractions considered to be "minor" versus "significant" non-compliance in the survey of four districts, and the actions taken as a result of the inspections. This information is also a good demonstration of the variety of situations encountered by inspectors during timber management operations (Ex. 2259). MNR describes the area inspection process as a heavy workload with the average district producing about 200-300 inspection reports yearly (Ex. 2258, p. 16).

While doing area inspections, MNR staff also monitor compliance of other resource users with decisions made during timber management planning. For example, MNR staff deal with issues such as public use of access roads where roads are restricted or closed for various reasons.

The standard required for compliance to Timber Management Plans must be stringent. These are, after all, legal requirements. Moreover, they are provided to make sure that good environmental planning and acceptable operations occur at the management unit level. We have not seen evidence sufficient to conclude that non-compliance is a problem that compromises the general acceptability of the environmental effects of the undertaking. We are ordering Conditions of Approval to ensure that non-compliance is minimized.

FFT submits that a "zero-tolerance" approach to non-compliance must be applied by MNR. While FFT offered no specific proposals on how a "zero tolerance" program might work, nor what precisely the term means, we do agree with FFT on the need to provide consistent and adequate enforcement and investigation of offenses under various statutes administered by MNR and related to ensuring compliance. For this reason we are providing Condition 88 requiring preparation of a handbook on investigation and enforcement.

88. Within one year of approval of the amendments to the *Crown Timber Act* submitted by MNR, MNR shall prepare a handbook to provide guidance to its field officers for the investigation and prosecution of offenses under the *Crown Timber Act*, *Public Lands Act*, the *Lakes and Rivers Improvement Act*, *Endangered Species Act* and other statutes relevant to timber management activities. In particular, MNR shall ensure that timber-related statutes and regulations are interpreted consistently, supervised adequately, and enforced fairly but firmly in all cases of non-compliance.

We do not agree with FFT that MNR should apply a rigid "stop operations" rule as suggested by FFT where "significant adverse effects are identified." We prefer to provide MNR with the discretion to govern such circumstances with its best judgement in order to apply remedies appropriate to the circumstances. Ultimately, such effects are subject to the monitoring mechanisms described below.

Area Inspections

MNR's "cut inspection" program, in place for some 30 years, has evolved in format and approach over time. It has been primarily concerned with monitoring the harvest activity, especially location, utilization and compliance with license requirements.

Over the years, compliance monitoring has also focused on quality control of silvicultural activities and road construction to check compliance with contract specifications or stipulations in work permits. Today, subject to Forest Management Agreements, quality control of silvicultural work taking place on FMA lands is the responsibility of the company, with a requirement to re-treat at its own expense if certain performance standards are not met (Ex. 513). MNR is responsible for quality control of silvicultural treatments, pesticide and other protection operations, and road construction work otherwise carried out under contract with the Crown.

In addition, operators are required to maintain certain records, and to provide mapped information concerning cutovers on an annual basis. These maps are commonly accompanied by aerial photographs of the harvested area. These maps and photographs provide an additional method of compliance monitoring for the locations of harvest areas and roads on the management unit as a whole.

MNR strengthened its compliance monitoring program with additional field inspections beginning on April 1, 1990. The area inspection program was initially described in MNR Statement of Evidence No. 16, which included a draft policy on Area Inspection of Timber Management Activities (Ex. 915). Since that evidence was prepared, MNR has finalized its policy on Area Inspection of Timber Management Activities (Exhibit 2258).

The area inspection reports are the key to compliance monitoring. This program has a broader focus than the traditional cut inspections and is used to monitor all timber management activities for compliance with the approved timber management plan, including the silvicultural ground rules, specific prescriptions for operations in Areas of Concern and exceptions to the silvicultural guides and implementation manuals. We are ordering Conditions 55 and 78 requiring area inspections and other aspects of compliance monitoring.

- 55. (a) Each Timber Management Plan shall contain a discussion of the following monitoring provisions:**
- (i) a general description of the "area inspection program" (see Condition 78) for that forest management unit, and specific provisions for monitoring operations in individual Areas of Concern or groups of Areas of Concern having common values;**
 - (ii) specific provisions for monitoring the effectiveness of any silvicultural treatments which are "exceptions" to the recommendations in the silvicultural guides, as described in Condition 26(b);**
 - (iii) specific provisions for monitoring the effectiveness of any prescriptions which are "exceptions" to the recommendations in any other implementation manual, as described in Condition 42(c); and**
 - (iv) the program for carrying out Free-to-Grow Assessments for both naturally and artificially regenerated areas on that forest management unit.**
- (b) The monitoring provisions shall address the methods to be used, the timeframe for monitoring, and reporting requirements.**
- 78. (a) MNR shall monitor the timber management activities of access, harvest, renewal and maintenance for effects, effectiveness and compliance with approved Timber Management Plans and any other conditions imposed on operations by legislation or policy. The area inspection program and where appropriate other means such as contract administration and project supervision, will be used by MNR to monitor compliance with:**
- (i) the approved Timber Management Plan, silvicultural ground rules, specific prescriptions for operations in "Areas of Concern," and exceptions to the silvicultural guides, and implementation manuals as provided for in Condition 55; and**
 - (ii) acceptable practices as described in implementation manuals as amended from time to time.**

- (b) When monitoring timber management activities, MNR shall record any undesirable conditions which are observed in the areas of operations, and which appear to be related to timber management activities including:

 - (i) incidents of road washout in Areas of Concern and their observed environmental effects;
 - (ii) incidents of wastage of merchantable and unmerchantable timber specifying the amount of wastage by volume, the reason for wastage, and enforcement actions taken.
 - (iii) incidents of trespasses of timber operations onto reserves
- (c) For each forest management unit, area inspection reports shall document:

 - i) the location of the inspection;
 - ii) details of the inspection including the date, identity of the inspector, type of activity inspected, purpose and method of inspection;
 - iii) results of the inspection, including any details of non-compliance, and a description of the observed undesirable conditions (as described in Condition 78(b)); and
 - iv) required actions and actions taken, where appropriate.
- (d) Area inspection reports for each forest management unit shall be retained at the appropriate district office and will be available for public inspection until at least one year after the expiry of a Timber Management Plan for the unit.

MNR proposed that the reports of area inspections be available for public review and summarized annually in the Report of Past Forest Operations in each Timber Management Plan (Ex. 915). We agree with this proposal and order it as Condition 21, Appendix 8, section 1(e) which is found at the end of this chapter. These conditions mean the area inspection reports will have a local monitoring aspect and that MNR must do more comprehensive local compliance monitoring.

Post Operations Inspection

The OFAH/NOTOA Coalition proposes a system requiring forest companies to prepare post-operations reports on all timber management activities within six months following completion of timber operations. MNR would then collect these post-operation reports and prepare an addendum with its actions or proposals to deal with reportable events. This

material would be circulated to the planning team and Local Citizens Committee, and made public before approval of the following year's annual work schedule.

Good environmental planning requires an adequate level of timber operations monitoring but in our view these proposals go further than necessary given that other mechanisms we are providing will adequately serve this purpose. Also, we are not confident that the Coalition's proposals could be implemented.

We conclude that it is not necessary to prepare, collect, circulate and compile "post-operations reports" for all timber management activities, particularly for companies with a record of reliable compliance. We believe post-operation conditions are adequately reported through the area inspection program for the forest management unit in the Timber Management Plan, including specific provisions for monitoring operations in Areas of Concern. A summary of the area inspection reports for the five-year term of the Timber Management Plan will be included in the Report of Past Forest Operations and its analysis of problems encountered and strategies considered in achieving objectives (Condition 17 and Appendix 8). This provides a reasonable basis for establishing the number, frequency and timing of area inspections and for reporting on the summarized results of these activities for both public information and for use in timber management planning. In our view these provisions are comparable to a post-operations overview and will adequately fulfil the purpose of the post operations inspections reports without applying an onerous and broad-brush requirement.

Audits

Another fundamental component of compliance monitoring is auditing. There are two kinds of audits provided in our approval: internal MNR-conducted audits (Condition 85) and independent audits (Condition 86). These audits focus on compliance within management units although their results are also used in order to report on provincial-level effectiveness and compliance.

Internal Audits

The significance of the internal audits is that they scrutinize MNR's own performance. These audits will periodically examine ministry operations and records for the purpose of substantiating that the objectives of the activities are being achieved, that technical standards are being met, and that policies are being followed (Ex. 915).

In the context of the timber management program, internal audits are conducted to check that the provincial timber management policies, procedures and guidelines are being followed, and that compliance with timber management planning requirements is occurring. These audits also check such things as administration of silvicultural and other contracts, and actions taken to detect problems of non-compliance with performance standards and with environmental protection measures.

Internal audits are specifically stated to be inter-disciplinary in nature. Therefore, an audit of a timber management program will be conducted by a team which includes, for example, a wildlife specialist (Ex. 2258). The inter-disciplinary team is expected to consider and comment on the status of the inventory information of the forest management unit and on plan implementation both for timber and non-timber values. In addition, data collection priorities will be addressed.

The parties (MNR, OFIA, MOEE and FFT) agree to the substance of Condition 85 except for FFT's proposal that the public be notified of the audit's availability for public inspection and comment. We have rejected this proposal as being redundant given that Appendix 4, part A, section 1(c)(iii) on "information available for public consultation" includes availability of current audits.

85. MNR shall undertake interdisciplinary internal operational audits with respect to compliance with the timber management planning process, approved Timber Management Plans, implementation manuals, and relevant provincial policies, obligations, procedures and legislation. The audit shall include an assessment of the availability of inventory information with respect to timber and non-timber values for the forest management unit for use in timber management planning, with recommendations concerning any data collection priorities that should be addressed.

In addition, the audits shall assess the effectiveness of timber management activities in achieving timber management objectives and in providing assistance in meeting non-timber objectives.

Independent Audits

By the terms of the *Crown Timber Act*, FMA management units are required to undergo a review of their performance every five years. Beginning in 1987, this review has been conducted by teams of non-government persons with various types of business, forestry or wildlife expertise. The auditors assess compliance with the timber management planning process, approved plans, implementation manuals, and relevant provincial policies, obligations, procedures and legislation. We heard extensive evidence from Mr. John Duncanson who, since 1989, has coordinated nine independent audits of FMA areas. He

explained the key features of these audits as being their independence from MNR and the industry; the intensity and scope of the review process; the element of public input; and the review of matters extending beyond simple compliance to the agreement. Based upon what we heard from Mr. Duncanson and other witnesses concerning these audits, we are persuaded that the concept is a good one and it should be extended beyond the FMA program to include company and Crown management units, as we concluded earlier in Chapter 6.

MNR argued that the cost of applying this audit regime to all non-FMA units is too great and would require a change to MNR funding priorities. MNR argues instead that "...an appropriate number of Company and Crown Management Units be audited randomly each year by independent audit teams."

OFIA and FFT argue that the five-year cycle should apply to all management units. In their evidence, OFIA renewal experts outlined the primary concern of OFIA that all management units should be managed to, and measured by, the same standards. We agree that it is necessary to provide for a uniform assessment of Crown and Company Management Units and FMAs in order to ensure the measures we are providing for renewal. As Mr. Jim Waddell for OFIA indicated:

...we firmly believe that Crown management units must be managed to the same standards as are FMAs. And this is essential if we are going to maintain an adequate wood supply for the future. So that we believe that the performance of the timber managers on Crown management units must be subject to the same compliance monitoring as on FMAs.

(trans: vol. 199, p. 35240)

It is essential that silvicultural effectiveness on all management units be similarly evaluated and reported to ensure complete, open and meaningful accountability to the public for management of the timber resource. Mr. Armson, in his Reply evidence for MNR, confirmed that there is no silvicultural rationale for distinguishing between management units for the purpose of auditing (trans: vol. 392, p. 67608).

MNR's concern over the cost and difficulty of extending these audits to the remaining management units is noted and we are therefore providing condition 72(e) which permits MNR to select six additional non-FMA management units each year for independent audits. About 30 of the 90 management units are FMAs, therefore, the remaining 60 or so non-FMA management units will take approximately 10 years to pass through the audit process one time. We heard evidence that some of these units are of relatively marginal importance

to the undertaking or are less intensively utilized. An approximate 10-year review cycle will in our view sufficiently meet the need to deal with this problem so long as MNR begins with those most intensively harvested. We are requiring a reporting of the major problems encountered in the internal audit in the Annual Report to the Legislature (Appendix 20) and for MOEE's review at the end of the approval as provided in Condition 114.

One final matter concerning audits is FFT's proposal that management units as well as regions and districts be subject to independent audits and that the purpose be to assess "... MNR's performance in managing Crown forests for the optimum social and economic benefit of all Ontario residents" (Ex. 2249). Such a requirement appears to go well beyond the scope of the independent audits we heard described to us. We do not agree that such a provision is appropriate for the purposes of an audit. Even if it were possible to provide a reasonably objective mechanism with which to gauge this test, we believe that MNR has fulfilled the standard of meeting the purpose of the *Environmental Assessment Act* by our approval and should not be required to repeat this test at the moment of each audit.

86. (a) MNR shall undertake operational audits, through the appointment of suitably qualified independent audit teams, which will include an assessment of compliance with the timber management planning process, approved Timber Management Plans, implementation manuals, and provincial policies, procedures, and legislation. At least one member of the Audit team shall be a Registered Professional Forester. Terms of reference for these audits are set out in Appendix 25.
- (b) The audits shall assess the effectiveness of timber management activities in achieving management objectives. These audits will include any assessments of silvicultural effectiveness.
- (c) MNR shall design a set of procedures and guidelines for the undertaking of these audits. These procedures and guidelines shall be designed to empower an appointed audit team to act as an independent body. The guidelines and procedures will also be constructed to meet the requirements of Section 6 of the *Crown Timber Act*, R.S.O. 1990, c. C.51, as amended, in order that the Minister of Natural Resources may report to the Legislature.
- (d) MNR shall provide remuneration and expenses for each audit team. MNR shall provide funding for the preparation and publication of the audit report by each appointed audit team.
- (e) Each Forest Management Agreement in the province shall be audited every five years. In addition, six Crown and Company Management Units shall be audited each year, starting with those units with the greatest volume of wood harvested. The audit shall examine the activities over the past five-year period beginning

at a point in time which will allow comparison of three years of the previous Timber Management Plans and two years of the current Plan.

- (f) Audit reports shall be published by the audit team no later than four months after the initiation of the audit.
- (g) The independent audit teams shall provide an opportunity for the Local Citizens Committee for the forest management unit which is the subject of the audit to comment on management practices and to provide any other relevant information.

Effects/Effectiveness Monitoring

Introduction

Our approval provides for the first time in timber management planning explicit mechanisms going beyond MNR's traditional role of ensuring compliance with Plan requirements and operational rules and restrictions. We believe that by the terms of the *Environmental Assessment Act*, there exists a requirement for the proponent to monitor actively and adequately the effectiveness of management efforts and their environmental effects. Without such a mechanism there would be no specific obligation on MNR to observe and learn from its management and operational efforts. This is crucial to a rational and progressive regime of environmentally sound timber management. It is particularly important given the size of the Area of the Undertaking and the information gaps in forestry science.

No party before us disagrees that such a requirement is mandated and necessary, but they do dispute the form and extent that monitoring efforts must take. MNR proposes a gradual and measured development of monitoring techniques and initiatives based on clearly established and verified studies which identify linkages between environmental effects and their precise causes in management and operational effort. The Coalition and FFT urge more immediate efforts to inventory effects and effectiveness, suggesting that MNR's focus on causation is simply stalling. The Coalition urges an "adaptive management" approach focusing effects monitoring on the management unit level. For its part, FFT demands caution and a more comprehensive monitoring regime at the local level.

Effects/effectiveness monitoring was described by MNR as follows:

Effects monitoring is intended to assess the short and long-term, direct and indirect effects of timber management operations. Effectiveness monitoring is

intended to assess the effectiveness of timber management prescriptions and practices in terms of achieving the prevention, minimization and mitigation of adverse environmental effects.

(Ex. 4, p. 196)

No party before us disagrees with this characterization and we accept it as a useful summary. More important, no party has suggested that effects/effectiveness monitoring is not both worthwhile and necessary. We find that in order to meet the requirements of good environmental planning a satisfactory monitoring program is a fundamental requirement for an undertaking subject of a Class Environmental Assessment. As we have said, the guideline approach is an acceptable method by which to prevent, identify, remedy and mitigate environmental effects of the activities for both timber and non-timber values. The adoption by MNR of exception reporting when prescriptions are applied that are not contemplated by the applicable implementation manual and provisions to monitor those exceptions will provide essential data from across the Area of the Undertaking on how effective the implementation manuals are in achieving environmental protection.

There are two levels of effects/effectiveness monitoring: the local management unit and the province. While supporting MNR's commitment to monitoring initiatives provincially, regionally and at the management unit level, several of the intervenors are highly critical of what they see as shortcomings in the local monitoring regime proposed by MNR. Besides broadening the scope of monitoring generally, through this approval we specify a more comprehensive and systematic regime of monitoring effects and effectiveness at the local as well as at the provincial or regional level.

Local Effects Monitoring

Intervenors' Criticisms

In FFT's submission "the most important deficiency of the proponent's local monitoring proposals is the complete absence of a comprehensive local effects/effectiveness monitoring program."

OFAH/NOTOA has similar reservations, complaining that MNR relies far too much on higher level management input and monitoring at regional, district and provincial levels.

MNR has proposed that each plan contain a general description of the area inspection program but specific monitoring provisions are only required for Areas of Concern and

exceptions to the implementation manuals. In FFT's view the apparent distinction between AOC/exceptions monitoring and other local monitoring demonstrates that the proponent does not accept that the Area of the Undertaking itself may be regarded as an "Area of Concern." It is argued by FFT that the area inspection program only went into effect in April 1990, and it is therefore questionable whether MNR and company staff, let alone members of the public, are sufficiently familiar with its requirements. In FFT's view, there are significant values (i.e. site productivity, advanced growth, etc.) outside of AOCs making compliance monitoring in areas of normal operations both necessary and desirable. Accordingly, FFT submits that monitoring details must be specified for both AOCs/exceptions and areas of normal operations.

We find FFT's proposals flawed because of their vagueness and their potential to lead to an excessive and unworkable situation at the management unit level. In particular, FFT's submission that the entire Area of the Undertaking "may be regarded as an area of concern" and, therefore, requires similar monitoring treatment strikes us as being unrealistic. The AOC process and the exceptions monitoring process are designed to focus management attention on those sites and locations where particular attention is required. Areas of normal operation are contemplated as such precisely because they can be adequately managed in a sound environmental manner without such particular attention. As a general proposition, we are satisfied that MNR's understanding and control over effects in areas of normal operation are adequate with the level of monitoring for compliance and effects/effectiveness of a generic nature. Where such is not the case, then clearly the AOC and exceptions processes are necessary and should be applied – with their attendant monitoring requirements.

The intervenors told us that the United States Forest Service is required by law to conduct local effects monitoring. Dr. Jack Ward Thomas, brought as a witness by the Coalition, clarified for us some of the difficulties involved in local effects monitoring and said it is still in the stage of being developed in the United States. We take from his testimony that there is no local effects monitoring system operating in the U.S. National Forests that can serve as a model today for our use in Ontario. Dr. Thomas told us:

We are required by law to do monitoring. It's divided. Compliance monitoring means you go out and check to see if you did what you were supposed to do. That's fairly straightforward, fairly measurement.

The local effects monitoring in terms of pounds of forage production, in terms of a certain soil condition remaining after harvest and hydrological conditions, we are still fighting that out in how we are going to monitor it and we have promised a lot in monitoring.

Now when it comes time to do it we are going to have to figure out how we can do it within the level of resources that are available to us. It is one thing to go in and say I need a thousand units of resources to monitor this appropriately and your congressman or the U.S. Congress falls over backwards laughing and says: No, you get a hundred, and then we go back and figure out how to do the best we can with what we have got which is a hundred, but that is being worked out now.

The local effects monitoring will be different from planning area to planning area because the objectives will be different, but those details are just now being worked out. The only thing I can tell you for sure it is required by law and we are going to do it at some level.

MR. MARTEL: At some time.

DR. THOMAS: Well, we are going to do at some level pretty quick or under our system we are going to get shut down. We are going to come into compliance with the law one way or another. We are doing the best we can with what we've got.

(trans: vol. 354, pp. 61675-76)

Reporting

The Report of Past Forest Operations and its statement on proposed objectives, targets and strategies in each Plan are the central means of monitoring the effects of timber management at the local level, and carrying forward the results of previous Plans into the development of the current and future Plans. By the terms of this approval we are expanding the contents and focus of MNR's proposed Report of Past Forest Operations significantly. We have approved with some changes, the terms of Condition 21 as proposed by OFIA:

21. (a) Each Timber Management Plan shall contain a Report of Past Forest Operations, which reports on operations carried out during the five-year term of the previous Plan. The contents of the Report of Past Forest Operations and its analysis of meeting objectives, targets and strategies are listed in Appendix 8.
- (b) The Plan author shall prepare a summary that provides an analysis of past operations and the results of the independent audit. The summary will highlight problems, issues and various objectives for access, harvest, renewal and maintenance as well as the proposed strategies to achieve each objective.

The contents of the Report of Past Forest Operations are specified in Appendix 8 at the end of this chapter and are aimed at providing a comprehensive and systematic retrospective of the previous five-year Plan. It will describe observed compliance, effects and effectiveness on the management unit of the undertaking by summarizing the area inspection reports. In this way, each Plan will disclose observed results of the three essential elements of monitoring, albeit over the relatively short period of a five-year Plan. Longer term effectiveness and effects are considered below. It will also compare "planned versus actual" information for each of the five years of the previous plan. Clearcuts will be monitored for their size, extent and frequency. Given Condition 27 specifying a range of clearcut sizes up to 260 hectares, it will be necessary to observe not only compliance to this rule but also to learn how frequently it may be exceeded and why. Monitoring of clearcuts will be provided through the Annual Report for the Forest Management Unit (Appendix 18), the Annual Report to the Legislature (Appendix 20) and the Report of Past Forest Operations (Appendix 8). It is also reported to MOEE (Condition 114).

Monitoring of road construction, maintenance and abandonment is necessary to demonstrate how the road system is developing in a given management unit. This information is available and will be represented on maps as well as statistically. See Conditions 46(b) and 52(c) and Appendix 8, section 1(a)(vii).

The Coalition persuaded us of the public's interest in knowing certain silvicultural statistics and the revenue government receives from logging. The Report of Past Forest Operations will also provide statistics on volume losses due to natural forces and wood wastage (Appendix 8, sections 1(a)(iii) and 1(a)(x)). We are providing for an accounting of annual government revenues from each management unit to show how much money was earned from stumpage and area fees.

The Report of Past Forest Operations is not intended to stop at recitation of observations but must go beyond this to offer discussion and recommendation of problems and possible solutions. This will provide public notice of MNR's rationale for planning in future. It will also focus public awareness on any shortcomings of Plan implementation and the consideration of alternatives intended to address them.

In addition to the retrospective reporting requirements set out above, we are ordering substantial requirements for monitoring in current and future Timber Management Plans in Condition 55. We are satisfied that all these conditions will provide for monitoring of local effects/effectiveness as part of a comprehensive framework.

Provincial Level Monitoring

Guidelines

In contrast to local effects that might be seen at the management unit, there are other environmental effects on non-timber values that can only be detected at the provincial level. Given our approval of MNR's management by the implementation manual approach, it is crucial that there be a sound and systematic program of research and development into the effectiveness of the provincial guidelines. It is MNR's argument that sound environmental planning can be implemented at the management unit level so long as the effectiveness of the guidelines are monitored and we agree with this principle. The alternative seems to us to be to delegate management control to individual management units and adopt some form of local "adaptive management" as suggested by some of the intervenors. We agree, however, with MNR's case for the importance of maintaining central and provincial control over such fundamental management matters as levels of production, uniformity of silvicultural and regeneration treatments and provision for non-timber values.

MNR explained that its approach and initial project design for monitoring the moose, fish and tourism guidelines came from a series of ESSA (Ecological and Social Systems Analysts Ltd.) workshops involving MNR and other experts. The monitoring programs were intended to:

- meet high scientific standards;
- provide results representative of the province;
- assess both short and long term effects;
- provide controls and generate baseline historical data;
- be practical from a cost and scientific point of view;
- adequately represent stakeholder concerns; and
- improve understanding of the significant environmental effects.

There have been significant developments since that time. We were told during MNR's reply evidence that the evaluation programs for the effectiveness of the moose habitat, fish habitat and tourism guidelines have already been initiated by an integrated research group at the Centre for Northern Forest Ecosystem Research (CNFER) at Lakehead University in Thunder Bay. These provincial effects/effectiveness monitoring studies are an expensive

investment – MNR estimates their cost to be about \$10 million annually (Ex. 2309, p. 26) – and the estimated timetable for their completion is as long as 10 years, for example, for the moose monitoring study.

MNR must report on the results of these projects as results become available and also at the time of the eighth-year review of this Class EA by MOEE (Condition 114(c)). As well, MNR will provide progress reports to the Director of the Environmental Assessment Branch of the Ministry of Environment and Energy on improvements to the implementation manuals and advances in scientific research and technical development. These reports shall be available to the public (Condition 111).

We are ordering Condition 80 and Appendix 19 to require long term scientific study into moose, fish, tourism and other wildlife management guidelines.

- 80. MNR shall undertake long-term scientific studies to assess the effectiveness of the provincial guidelines for moose and fish habitat and tourism values. These studies shall include an assessment of the effects of current timber management practices on moose and other wildlife habitat, fish habitat and tourism values. Particulars of this condition are set out in Appendix 19.**

APPENDIX 19: PROVINCIAL LEVEL MONITORING: LONG-TERM SCIENTIFIC STUDIES

1. Timber Management Guidelines for the Provision of Moose Habitat

The studies will:

- (a) assess the efficacy of the guidelines in providing moose habitat; and
- (b) recommend improvements to the guidelines.

2. Timber Management Guidelines for the Protection of Fish Habitat

The studies will:

- (a) assess the efficacy of the guidelines in protecting fish and fish habitat;
- (b) investigate the relationship between forest cover manipulation and protection of fish habitat in the Ontario situation;
- (c) apply study treatments to both lakes and streams;
- (d) include the following measurements:

- (i) watershed mapping (e.g. boundaries of watersheds, lake bathymetry, forest mapping, fish spawning sites),
 - (ii) stream water levels and flow,
 - (iii) selected water quality parameters (e.g. phosphorus, temperature, dissolved oxygen, pH, alkalinity),
 - (iv) turbidity and major ion composition,
 - (v) sediments (e.g. substrate composition in spawning areas, downstream from road water crossings), and
 - (vi) fish population characteristics; and
- (e) recommend improvements to the guidelines.

3. Timber Management Guidelines for the Protection of Tourism Values

The studies will:

- (a) assess the efficacy of the guidelines by sampling tourism operations in Northern Ontario (e.g. remote mainbase lodges, accessible mainbase lodges, outpost camps); and
- (b) recommend improvements to the guidelines.

4. Other Wildlife

The studies will:

- (a) assess the efficacy of the Timber Management Guidelines for the Provision of Moose Habitat in providing habitat for other wildlife species;
- (b) assess the efficacy of timber management practices other than those described in the Timber Management Guidelines for the Provision of Moose Habitat in providing habitat for other wildlife species; and
- (c) recommend modifications to appropriate implementation manuals or the development of new implementation manuals.

Wildlife

The other component of provincial level monitoring includes wildlife population monitoring. We note that FFT generally supports MNR's proposal to conduct provincial level monitoring of certain wildlife species, including those with specialized habitat requirements (i.e. snags,

dead and down woody material, riparian areas, mature/overmature stands, and large areas in a similar successional stage). We are ordering Condition 81 for this purpose.

81. MNR shall develop and implement a Provincial Wildlife Population Monitoring program within the Area of the Undertaking. This program will monitor population trends of representative terrestrial vertebrate species. Those species include:

- (a) species which benefit from application of the Timber Management Guidelines for the Provision of Moose Habitat and/or the Timber Management Guidelines for the Provision of White-Tailed Deer Habitat (in preparation);**
- (b) species which benefit from application of Timber Management Guidelines for the Provision of Pine Marten Habitat (pursuant to Condition 94(c)) and/or the Timber Management Guidelines for the Provision of Pileated Woodpecker Habitat (pursuant to Condition 94(c)).**
- (c) species which utilize the following habitat types and features: snags, dead and downed woody material, riparian areas, mature/overmature stands, and large areas in a similar successional stage.**

FFT submits, however, that such monitoring is not an acceptable substitute for local wildlife effects monitoring. In addition, FFT submits that the provincial monitoring program should specifically include species which do not benefit from the moose/deer guidelines, including vulnerable, threatened and endangered species. The reason for this expansion is obvious: first, MNR itself has admitted that 30% of terrestrial vertebrates do not benefit from the moose/deer guidelines; and second, it is desirable to monitor provincial populations of vulnerable, threatened and endangered species.

We have provided our findings on local effects monitoring above and as a result cannot agree with FFT's specific proposal for wildlife monitoring at local levels. We are, however, providing Conditions 81 and 94(c) to address a provincial level of wildlife monitoring in an attempt to redress the problem of insufficient coverage of the current featured species program. In Chapter 11, we discuss our reasons for accepting the Coalition's submission that including pine marten and the pileated woodpecker as provincially featured species would provide more comprehensive coverage of wildlife habitat in the boreal and in the Great Lakes St. Lawrence forest. We also agree that provision for locally significant and provincially threatened or endangered species is necessary. The Coalition's proposal, which we have endorsed, will provide for the protection of wildlife and plants at the local level. We believe that this is a useful and flexible approach to this concern and can be provided by timber management planning.

Reporting During This Approval

The results of provincial level monitoring will be made public primarily through the Provincial Annual Report on Timber Management to the Legislature (Condition 82) and the five-year State of the Forest Report (Condition 84). These conditions are listed at the end of this chapter. We are requiring these reports to be tabled in the legislature where there will be opportunity for debate and public scrutiny. Both these reports will be widely available to the general public and included in the background information available at timber management planning information centres.

By this approval we are placing strong reliance on the reporting requirements found in the Annual Report to the Legislature. This mechanism will give prominence to the status and progress of certain important management and policy development initiatives. These are set out in Appendix 20, 1(p) and they include:

- Condition 27 Clearcut size and configuration monitoring;
- Condition 52(e) Water crossing removal criteria development;
- Condition 94(b) Environmental Guidelines for Timber Management Activities;
- Condition 94(c) Pine Marten and Pileated Woodpecker habitat guidelines;
- Condition 96 Silvicultural effectiveness monitoring initiatives;
- Condition 97 Forest Ecosystem Classification Program;
- Condition 98 Northern Ontario Wetlands Evaluation System;
- Condition 99 ANSIs;
- Condition 100 Growth and Yield Studies;
- Condition 101 Full Tree Harvest / Long term Productivity;
- Condition 102 Tending and Protection improvement Program;
- Condition 103 Old Growth;
- Condition 104 Socio Economic analysis;
- Condition 106 Roadless Wilderness Areas Policy;
- Condition 107 Landscape Management, Biodiversity, HSA;
- Condition 108 Geographic Information Systems;
- Condition 110 District Land Use Guidelines.

Some of these conditions specify time periods during the term of the approval when they are to be completed and or implemented. MNR will report on their progress until the initiative is completed. For those matters specified without a time limit, each successive annual report to the legislature shall deal with the matter.

Reporting and Extension of This Approval

Condition 114 provides that MNR shall make a report to the Minister of Environment and Energy in the eighth year of this approval. This report is intended to provide an opportunity

for a review of the undertaking so that the Minister of Environment and Energy can consider MNR's success in implementing the undertaking and generally the success of this approval. This will better enable the minister to exercise his or her authority under the EA Act to provide a renewed approval for this undertaking. We note that Condition 114 speaks of possible "extension" of this approval upon its term. We understand this mechanism is related in the specific legal sense to the Minister of Environment and Energy's authority under the Act to exempt the undertaking, in whole or in part from application of the requirements of the Act, for example, the requirement to submit an environmental assessment.

The topics dealt with under Condition 114(a)(v) will include:

- Condition 24 Visual Resources,
- Condition 27 Clearcut size restriction,
- Condition 52(e) Road Crossing Criteria,
- Condition 80 Long term Scientific effectiveness monitoring,
- Condition 81 Terrestrial Vertebrate Monitoring,
- Condition 93 Implementation Manual Review,
- Condition 94(a) Silvicultural Guide, Site types; Ground Rules Review,
- Condition 94(b) Environmental Guidelines Review,
- Condition 94(c) Featured Species Guidelines,
- Condition 94(d) Mixed Wood Silvicultural Guide,
- Condition 95 Inventory Information Collection,
- Condition 96 Renewal efforts,
- Condition 97 FEC Development,
- Condition 98 Wetlands Evaluation,
- Condition 99 ANSI's
- Condition 100 Growth and Yield,
- Condition 101 Full Tree Logging / site productivity,
- Condition 102 Tending and Protection technology and alternatives,
- Condition 103 Old Growth strategy,
- Condition 104 Socio Economic tools study,
- Condition 105 Timber Production Policy,
- Condition 106 Roadless Wilderness Areas,
- Condition 107 HSA, Biodiversity, Landscape Management,
- Condition 108 GIS,
- Condition 109 Continuing Skill Upgrading,
- Condition 110 District Land Use Guidelines.

Silvicultural Effectiveness Monitoring

Introduction

In Chapter 6 we set out our findings on forest renewal. Regenerating the forest is crucial to the success of timber management planning because it is the cornerstone of success in the managed forest. For this reason, our concern is to institute careful monitoring of the effectiveness of overall silvicultural effort and regeneration particularly. We have accepted many of MNR's proposals in this regard and we have gone beyond to accept much of what MOEE urged as necessary improvements.

MNR's current data collection, analysis and reporting practices do not allow for a meaningful assessment of silvicultural effectiveness. Unless appropriate silvicultural information is collected and reported in a Timber Management Plan, it is impossible to determine if the new forest is growing back as planned. MNR needs to identify what information is required to develop the systematic ability to track that information over time, and to use consistent measures of success and consistent definitions of silvicultural effectiveness to determine whether objectives are being achieved.

First we need to know what is meant by the term silvicultural effectiveness. In his written evidence and subsequent testimony, Mr. Herb Bax, a witness for MOEE, defined silvicultural effectiveness to mean "achieving the desired management objectives at the lowest possible cost and that it be consistent with sound environmental practices" (trans: vol. 372, p. 64714).

As an example, Mr. Bax discussed a black spruce stand harvested by clearcutting. If a portion was renewed by planting and another by seeding and both treatments attained the same level of stocking, then the portion of the stand that was seeded would be the one that was renewed most effectively – the management objectives were met at the lower cost.

In Mr. Bax's opinion the information needed to track silvicultural effectiveness is not provided in existing Timber Management Plans. In particular, Mr. Bax testified that: "... it is necessary and essential to have a straightforward way to trace in a Timber Management Plan from what is proposed to what has actually occurred" (trans: vol. 372, p. 64713).

We found Mr. Bax to be a forthright and competent witness who identified desirable improvements to silvicultural effectiveness monitoring. Our Conditions of Approval for silvicultural effectiveness are intended to address the concerns delineated by Mr. Bax, and

to provide a practical and systematic means by which to track and report on silvicultural effectiveness.

MNR's area inspection program, essential to the monitoring of compliance, ignores the monitoring of silvicultural effectiveness, except for recording any observed "undesirable conditions" (MNR proposed Condition 64(b)). A record of undesirable conditions, however, is no replacement for appropriate monitoring at the management unit level. In order to track silvicultural successes and failures for a specific piece of geography at the management unit level and ultimately to the provincial level, monitoring must be done on a consistent basis. In other words, experience and knowledge of a successful or failed silvicultural treatment on particular sites in one management unit or district should be applied or avoided on similar site types throughout the province.

We found agreement among the expert witnesses that it makes little sense to monitor exceptions for effectiveness (MNR proposed Condition 45(b)) and not to report specifically on the effectiveness of the silvicultural ground rules. Mr. Bax testified for MOEE that in his view much of the information on silvicultural effectiveness is currently available in project records, but is not reported in the Timber Management Plan (trans: vol. 372, p. 64746 and trans: vol. 373, pp. 64762-63). Mr. Armson testified for MNR that information on successes and failures, and more important, the reasons for those successes and failures, must be available on a consistent basis across the province (trans: vol. 38, pp. 6323-26). Mr. Marek, witness for FFT, agreed that in order to track silvicultural effectiveness, a mechanism is needed to trace the results of prescriptions back to the initial action taken (trans: vol. 263, p. 47429).

Report of Past Forest Operations

As we discussed above, the results of monitoring compliance and effects/effectiveness will be found in the Report of Past Forest Operations and similarly, the results of silvicultural effectiveness monitoring will also be found in this report of what happened in past Plans.

The Report of Past Forest Operations is a section of a Timber Management Plan where planned operations for the previous five-year term are compared to actual achievements. MNR's Timber Management Planning Manual states that this comparison will measure progress toward meeting stated objectives and their associated targets.

The Timber Management Planning Manual goes on to indicate that:

The comparison of planned operations to actual achievements for previous term(s) will assist in determining planning direction for subsequent terms of the plan. The results of this comparison will either confirm the effectiveness of chosen strategies or will result in recommendations for revision of strategies for the next term of the plan.

This information will be used in formulating the silvicultural ground rules for the next five-year term of the Plan. The monitoring of silvicultural effectiveness is aimed at determining if the implementation of the ground rules has produced successful outcomes.

Free-to-Grow assessments correlated to general standard site types discussed in the following sections are the most important tools for measuring silvicultural effectiveness and they will be reported in the Report of Past Forest Operations.

Free-to-Grow Measurement

The forecast and performance tables in the Report of Past Forest Operations do not require the same unit of measurement to be used as in the silvicultural ground rules. MNR's only description of silvicultural effectiveness is the Free-to-Grow (FTG) assessment which we described in Chapter 6, p. 214. FTG is reported by working group and treated or untreated, but not the specific treatment. While the FTG assessment will tell whether you have been effective in renewing a particular working group across the management unit level, it will not tell you which combinations of harvest, renewal and maintenance (i.e. the silvicultural package) resulted in that working group reaching FTG. Mr. Bax testified that: "I cannot determine, just to re-emphasize, which particular treatment or package was effective in renewing the working group from the data given in the TMP nor can I tell where they were effective in relation to the ground" (trans: vol. 372, p. 64722).

Based on current forecast and reporting requirements, MNR acknowledged in its Panel 16 evidence that reported FTG results may or may not be a reflection of the silvicultural treatment that was applied to the site, and therefore, it is impossible to evaluate the effectiveness of any silvicultural treatment in achieving its objectives (Ex. 915, MNR Panel 16, pp. 576-77; Silvicultural and Regeneration Effectiveness Monitoring, MNR Policy FR 14 02 20, pp. 576-78).

General Standard Site Types

When standardized site descriptions have been developed and are implemented by MNR they will become the key to future analysis of silvicultural effectiveness. MNR has

committed to amending the silvicultural guides within three years of the approval to include general standard site types (Condition 94(a)). We accept this condition and its time frame. We are also ordering Condition 40(a) to require mapping of the site types found in the silvicultural guides on the "areas selected for operations" map.

In order that it assist in determining silvicultural effectiveness, the general standard site type initiative must be used for reporting and monitoring as well. Accordingly, the information contained in the Report of Past Forest Operations will allow us to take advantage of general standard site types. The rationale is straightforward. Timber management activities are carried out on a site-specific basis, therefore, to evaluate their results, forecasting, reporting and monitoring must also be related to site characteristics.

The general standard site type initiative will be the basis for reporting the results of the silvicultural activities of harvest, renewal and maintenance. To integrate the results of these operations, which MNR now reports separately, stand listings will be required showing the silvicultural treatment package that was carried out on a specific piece of geography (Appendix 8, section 1(a)(viii)). We are also accepting by our Condition 26(a) the proposal of MOEE and FFT to identify the logging method in the silvicultural ground rules in each Plan. It should be noted that this condition allows an alternative to be substituted and reported.

In addition, areas assessed for and declared FTG will be reported by silvicultural treatment package. When general standard site types have been developed, then FTG will also be reported by general standard site type and silvicultural treatment package (Appendix 8, 1(b)). MNR indicated in its evidence that the single most important test of short term effectiveness is FTG (Ex. 915). Therefore, linking FTG with the prescriptions actually implemented on the ground will improve MNR's ability to report on short term silvicultural effectiveness.

The Report of Past Forest Operations will also include a statement of silvicultural effectiveness for the previous five-year term, in addition to reporting on areas assessed and declared FTG. Until the general standard site types are in place, a statement of silvicultural effectiveness should be provided by working group and silvicultural treatment package, and thereafter by general standard site type (Appendix 8, section 1(l)).

Mr. Bax persuaded us that this statement of silvicultural effectiveness could be prepared by the unit forester based on his local knowledge, expertise, and project records. Mr. Bax testified that:

From my review of plans and from talking to the foresters on the unit most of them have that already. They have a data base or a summary of their activities in a way so that they – they have to know what works where and rather than by individual they are going to group it and say these particular treatments, be it planting or seeding or whatever work on these particular sites. That's basic knowledge that he is going to – he either carries in his head or his data base or his summary data from the SAS records or some of the new initiatives that the Ministry is undertaking. So we're not asking for information, I don't think that isn't available. It's already there. It's just again, to put it in a form that there is a linkage so that anybody can trace it.

(trans: vol. 373, pp. 64754-55)

Information System

The class environmental assessment document states that "as part of MNR's effectiveness monitoring program, a comprehensive system for recording survey results at the local level is being developed. Aggregation of these results will provide regional and provincial summaries" (Ex. 4, p. 197).

Acknowledging the link between data collection and the capability to assess effectiveness, MNR has indicated that improvements should be made in the recording and reporting of silvicultural effectiveness (Ex. 2272). MNR intends to replace its current Silvicultural Information System ("SIS") and the Silvicultural Assessment System ("SAS") with a new Silvicultural Treatment Effectiveness Monitoring System (STEMS). We described this project in Chapter 3 and approved its implementation in Condition 80.

STEMS may address our concerns about silvicultural effectiveness monitoring but it may not be operational during the nine-year term of our approval. Dr. John Osborn indicated that enhancements are being made to SIS and SAS, but he could not say that these improvements will assist MNR in reporting on silvicultural effectiveness before STEMS becomes fully developed (trans: vol. 390, pp. 67271-74).

MNR argued that Mr. Bax's suggestions, while not without some merit, would be difficult to implement quickly. It warns that "fast tracking" such initiatives as STEMS would jeopardize initiatives with the existing SIS and SAS projects. In its reply evidence, MNR concedes that STEMS will ultimately provide for a comparison of "planned to actual" silvicultural treatments. We find this initiative is important enough to require specific conditions of approval in the Report of Past Forest Operations, the FMU annual report, the Annual Report to the Legislature and the State of the Forest Report in order to provide

silvicultural effectiveness monitoring results before the STEMS project is completed. These conditions are listed at the end of this chapter. We agree with MOEE's proposal to make developing initiatives reportable as they become available, and we expect that MNR will diligently pursue and implement these important initiatives at the earliest possible moment.

Much of the data to determine silvicultural effectiveness is presently gathered by MNR, but we agree with MOEE that a comprehensive analysis of the data was lacking from MNR's proposals for the Report of Past Forest Operations, Annual Report by FMU, Annual Provincial Report and five-year State of the Forest Report. Silvicultural effectiveness is a major component in determining this approval and in achieving the stated purpose of the undertaking. While MNR's programs to improve the reporting of silvicultural effectiveness are significant initiatives, our Conditions of Approval stipulate that statements of silvicultural effectiveness be provided at the management unit level and not just on a provincial basis. We believe this is a solution to assessing silvicultural effectiveness and reporting it in a transparent and traceable fashion until the STEMS approach has been implemented and tested.

One final and particular interest to many of the interventions we heard was the matter of how regeneration and tending activities are paid for. In particular is the concern that funds should be secure and available for regeneration activities. In Chapter 6, we discuss this matter at length. It is our finding that silvicultural effectiveness is contingent on adequate funding. In order to monitor the proponent's performance in this regard, we are providing in this approval for mechanisms to require reporting of planned and actual spending on tending and regeneration. This will be provided in the Report of Past Forest Operations pursuant to Appendix 8, section 1(a)(iv), the Annual Report for the Forest Management Unit pursuant to Appendix 18, section 1(o), the Annual Provincial Report to the Legislature pursuant to Appendix 20, section 1(g) and the State of the Forest Report pursuant to Appendix 22, section 1 (k).

Reporting System

Here are the conditions and appendices governing the major reporting requirements:

- 21. (a) Each Timber Management Plan shall contain a Report of Past Forest Operations, which reports on operations carried out during the five-year term of the previous Plan. The contents of the Report of Past Forest Operations and its analysis of meeting objectives, targets and strategies are listed in Appendix 8.**

- (b) The Plan author shall prepare a summary that provides an analysis of past operations and the results of the independent audit. The summary will highlight problems, issues and various objectives for access, harvest, renewal and maintenance as well as the proposed strategies to achieve each objective.

APPENDIX 8: REPORT OF PAST FOREST OPERATIONS

1. The Report of Past Forest Operations shall contain the following information concerning implementation of operations on the forest management unit during the five-year term of the previous Timber Management Plan:
 - (a) Statistical information comparing planned and actual activities for the previous five-year term including:
 - (i) area harvested;
 - (ii) volume harvested;
 - (iii) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (iv) area tended and area regenerated and the spending incurred to implement these activities by treatment method including but not limited to site preparation, planting, seeding, natural regeneration and tree improvement support.
 - (v) area tended and area treated for protection purposes, by treatment method including but not limited to cleaning: manual, chemical, mechanical; spacing, thinning; stand improvement);
 - (vi) tree improvement support;
 - (vii) kilometres of primary and secondary access roads constructed and maintained, signed or physically or naturally abandoned;
 - (viii) stand listings showing the silvicultural treatment package implemented;
 - (ix) annual government revenues from the FMU for stumpage and area fees;
 - (x) merchantable and unmerchantable timber wastage by volume and species pursuant to Condition 78(b)(ii); and
 - (xi) average and maximum size of clearcuts;
 - (b) a summary of areas assessed for Free to Grow status and areas declared Free to Grow shall be provided by silvicultural treatment package and upon

completion of the revision of the Silvicultural Guides pursuant to Condition 94(a) by general standard site type;

- (c) a summary of the area inspection reports for the management unit (prepared by MNR), including a description of the types of infractions encountered and actions taken during the term of the Plan, and recommendations for improving compliance, effects and effectiveness on the forest management unit;
- (d) a summary of the percentage of Maximum Allowable Depletion actually harvested, by forest unit or working group;
- (e) spending for maintenance and construction of primary, secondary and other roads;
- (f) a list of administrative, minor and major amendments, and an explanation of the reasons for the amendments;
- (g) a summary of audit results relating to the forest management unit;
- (h) conclusions on the success of meeting timber management objectives for the forest management unit;
- (i) conclusions on the success of meeting management objectives for non-timber values for the forest management unit.
- (j) a discussion of significant problems and issues arising during implementation of the Timber Management Plan for the previous five-year term. This discussion will include a description of any undesirable conditions which have been observed in the areas of operations for the previous five-year term, related to timber management activities;
- (k) recommendations for the development of the timber management strategies for the next five-year term to address problems and issues identified in the Report of Past Forest Operations, and
- (l) a statement of silvicultural effectiveness by working group and silvicultural treatment package shall be provided, and upon completion of the revision of the Silvicultural Guides pursuant to Condition 94(a) by general standard site type.

79. For each forest management unit, an "Annual Report" shall be prepared concerning the timber management activities which were carried out during the preceding year. The contents of this report are listed in Appendix 18.

APPENDIX 18: ANNUAL REPORT (FOREST MANAGEMENT UNIT)

1. The Annual Report shall contain the following information concerning implementation of operations on the forest management unit during the preceding year:
 - (a) area harvested, average and maximum size of clearcuts;
 - (b) volume harvested;
 - (c) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (d) area site prepared and area regenerated, by treatment method (e.g. site preparation: mechanical, chemical, prescribed burn; natural regeneration; scarification; artificial regeneration: planting container stock, planting bare root stock, seeding);
 - (e) area tended and area treated for protection purposes, by treatment method (e.g. cleaning: manual, chemical, mechanical; spacing; thinning; stand improvement);
 - (f) tree improvement support;
 - (g) kilometres of primary and secondary access roads constructed, maintained, gated, signed or physically or naturally abandoned;
 - (h) areas declared Free-to-Grow by silvicultural treatment package.
 - (i) a summary of the area inspection reports for the management unit (prepared by MNR) and a summary of the monitoring (compliance, effects and effectiveness) results as determined by an analysis of the following information, when available: Silvicultural Ground Rules; survival surveys; FTG results; stocking assessments; SOAR's; compliance monitoring results; area inspection reports; SIS, SAS; and audit results.
 - (j) government revenues from stumpage and area charges;
 - (k) spending for maintenance and construction of primary, secondary and other roads; spending for regeneration, tending and protection by treatment method;
 - (l) merchantable and unmerchantable timber wastage by volume and species pursuant to Condition 78(b)(ii);
 - (m) a summary of the percentage of maximum allowable depletion actually harvested, by working group;

- (n) identification of unresolved disputes over visual resource prescriptions pursuant to Condition 24;
- (o) forecast and actual spending on tending and regeneration pursuant to Condition 38(a).

82. MNR shall produce a provincial "Annual Report on Timber Management" which shall be tabled in the Legislature. The contents of this report are listed in Appendix 20.

APPENDIX 20: PROVINCIAL ANNUAL REPORT ON TIMBER MANAGEMENT TO THE LEGISLATURE

1. The Annual Report on Timber Management shall include:
 - (a) a summary of Ontario's land and forest base;
 - (b) forest products industry statistics and harvest volumes;
 - (c) area harvested and average and maximum size of clearcuts;
 - (d) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (e) government revenues from stumpage and area charges;
 - (f) spending for maintenance and construction of primary, secondary and other roads; spending for regeneration, tending and protection by treatment method;
 - (g) forecast and actual spending on tending and regeneration pursuant to Condition 38(a);
 - (h) a summary of management activities; and a summary of silvicultural effectiveness in the form of areas assessed for Free-to-Grow status, areas declared Free-to-Grow and condition survey results;
 - (i) a summary of the monitoring (compliance, effects and effectiveness) results, including a summary drawn from Annual Reports, prepared for each forest management unit in accordance with Appendix 18;
 - (j) results of negotiations with Aboriginal peoples pursuant to Condition 77 including statistics describing licences and resource allocation to Aboriginal peoples, on a district basis;
 - (k) a summary of major problems identified by independent audits as provided in Condition 86;

- (l) a list of all Timber Management Plans currently in preparation and those which are expected to be initiated in that year including a tentative list of starting dates;
- (m) kilometres of primary and secondary roads constructed, maintained, gated, signed or physically or naturally abandoned;
- (n) incidents of washouts of water crossings on access roads in Areas of Concern as provided in Condition 52(d) and the status of criteria specified in Condition 52(e);
- (o) merchantable and unmerchantable timber wastage by volume and species pursuant to Condition 78(b)(ii); and
- (p) progress reports on the following scientific research, technical development programs and policy development programs which MNR has undertaken:

Condition 27 Clearcut size and configuration monitoring;

Condition 52(e) Water crossing removal criteria development;

Condition 94(b) Environmental Guidelines for Timber Management Activities;

Condition 94(c) Pine Marten and Pileated Woodpecker habitat guidelines;

Condition 96 Silvicultural effectiveness monitoring initiatives;

Condition 97 Forest Ecosystem Classification Program;

Condition 98 Northern Ontario Wetlands Evaluation System;

Condition 99 ANSIs;

Condition 100 Growth and Yield Studies;

Condition 101 Full Tree Harvest / Long term Productivity;

Condition 102 Tending and Protection improvement Program;

Condition 103 Old Growth;

Condition 104 Socio Economic analysis;

Condition 106 Roadless Wilderness Areas Policy;

Condition 107 Landscape Management, Biodiversity, HSA;

Condition 108 Geographic Information Systems;

Condition 110 District Land Use Guidelines.

84. Every five years, MNR shall produce a provincial "State of the Forest Report" which shall be tabled in the Legislature. The contents of this report are listed in Appendix 22.

APPENDIX 22: STATE OF THE FOREST REPORT

1. The State of the Forest Report shall include:

- (a) an update of the "Forest Resources of Ontario, 1986," including a summary of age class distribution by working group for each MNR Region;

- (b) a summary of the preceding five "Annual Reports on Timber Management," including a provincial overview and summary of silvicultural effectiveness drawn from data contained in the Annual Reports;
- (c) wood supply synopses and projections by management unit, Region and cover type, and a description of typical strategies used to address wood supply concerns;
- (d) a discussion of wood supply as related to the purpose of the undertaking;
- (e) an estimate of the change in forest growing stock during the five-year term;
- (f) a description of progress on improvement of implementation manuals, advances in information collection and management, and scientific research and technical development; and
- (g) a description of relevant provincial-level problems and issues anticipated over the next five years, and a description of any programs or projects expected to be implemented or enhanced to address those problems and issues.
- (h) the effectiveness of the timber management planning process in terms of
 - (i) average and maximum elapsed time required to prepare and approve individual Timber Management Plans,
 - (ii) estimates of average preparation costs and actual time invested for individual Timber Management Plans.
 - (iii) a summary of minor and major amendments to approved Timber Management Plans since the last Report, including a record of input from Local Citizens Committees concerning the categorization of Plan amendments and
 - (iv) a complete record of all bump-up requests, and their disposition since the last Report.
- (i) the approved and updated Timber Production Policy pursuant to Condition 105(d);
- (j) conclusions on the success of meeting management objectives for non-timber values;
- (k) forecast and actual spending on tending and regeneration pursuant to Condition 38(a);

- (l) summary of the major unresolved problems associated with visual resources as provided in Condition 24; and
- (m) area harvested and average and maximum size of clearcuts.

CHAPTER 9

THE SOCIAL AND ECONOMIC ENVIRONMENT

PROFILE OF THE FOREST INDUSTRY

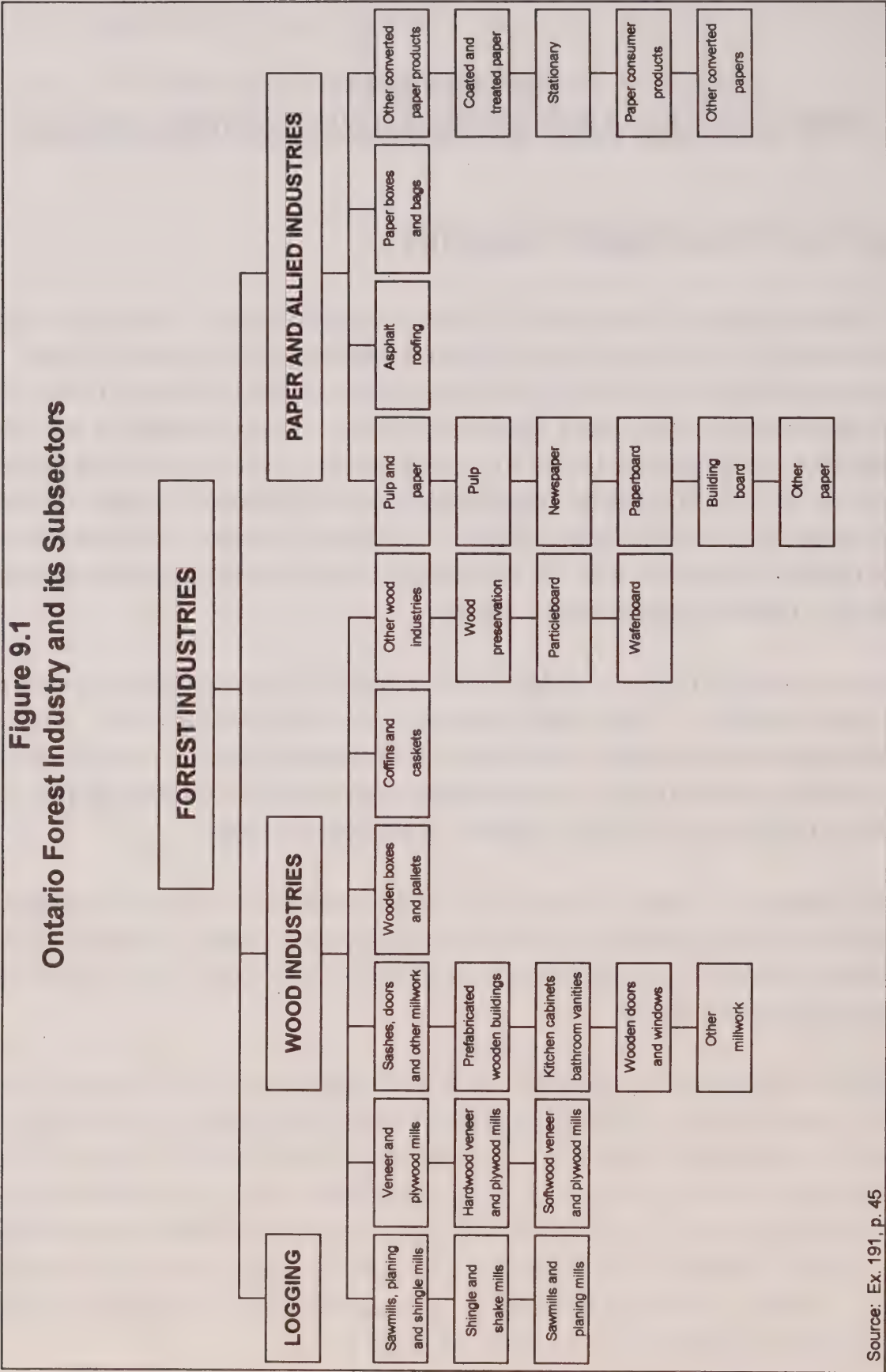
This hearing considered the effects of timber management not only on the physical environment, but on the social and economic environment of Ontario as well. The undertaking provides raw material for an industry that is vital to northern Ontario and is one of the mainstays of the entire province's economy. Some companies in this industry, ranging from small logging outfits to large integrated forest firms, are directly involved in carrying out the activities of timber management under MNR's direction, while others simply make use of the timber for their production. Evidence presented at this hearing on the forest industry was crucial both for establishing the need for this undertaking and for weighing its probable socio-economic effects.

The forest industry in Ontario is divided into three parts: logging, wood industries and paper and allied industries. The various subsectors are shown in Figure 9.1. The most comprehensive statistics about employment and the industry's economic contribution to the province were presented early in the hearing and based mostly on conditions in 1985. Later, MNR and OFIA provided updated statistics at the board's request.

The forest industry is characterized by a wide variety of players, from giant integrated paper manufacturers to small community sawmills or family logging outfits. The major companies are listed by industry subsector and shown on a series of maps on pp. 71-83 of MNR's Panel 5 Witness Statement, Ex. 191.

Primary forestry includes logging, as well as such related services as silviculture and fire fighting. MNR's evidence for this sector focused mainly on the province's 7,756 logging jobs, nearly all in the North. Alison Coke, an MNR senior economist, said data on the related services were not collected until recently (Update of Ex. 191, p. 43, MNR Question 12). When OFIA presented evidence on this subject, it argued that while employment figures have not been published for forestry services, there is enough information available to support an estimate of 6,460 jobs in the sector, in addition to the 7,756 directly involved in logging (Update of Ex. 1046, p. 11, OFIA Question 4).

Figure 9.1
Ontario Forest Industry and its Subsectors



Source: Ex. 191, p. 45

Although many logging operations are very small businesses, most of the logging is done by a few large integrated forest companies. A Canada-wide survey in 1984 found that about 60% of logging firms reported fewer than five employees. In 1986-87, more than 2,500 District Cutting Licenses were issued in Ontario. MNR said these licenses are normally held by small logging operators. They accounted in 1986-87 for about 8% of the total volume of Crown timber harvested (Ex. 191, p. 69).

The term "Wood industries" is defined to include sawmilling, planing and shingle mills; veneer and plywood mills; sash door and other millwork; wooden box and pallet manufacturing; coffin and casket making; and a category called Other Wood Manufacturing, such as particleboard and waferboard. In 1989, Ontario had 30,655 jobs in this sector, many of them working at hundreds of small sawmills across the province.

Paper and allied industries produce pulp and paper, asphalt roofing, paper boxes and bags and fine and specialty papers. There were 42,333 jobs in this sector in 1989, most of them in a small number of large mills. A study in 1983 found that about two-thirds of the jobs in this sector were in Southern Ontario (Ex. 191, p. 122). Adding the three sectors together, as shown in Figure 9.2, produces a total for direct employment in the Ontario forest products industry of 80,744. This does not include OFIA's estimated 6,460 jobs in forestry services.

MNR explained that it did not include printing, publishing or manufacturing of furniture and fixtures in its figures, in part because these activities might well take place in Ontario whether or not there was a provincial wood supply. (Ex. 191, p. 44).

In its evidence, MNR also provided estimates of the "value-added," the relative contribution of the forest industry and its components to the Ontario economy. Value-added is the difference between the total output of a firm or industry and the cost of materials, services and components that went into production (Ex. 191, p. 39). For 1989, the industry's contribution to total value-added was estimated at \$5.5 billion. Of that, \$500 million came from logging, \$1.3 billion from wood industries and \$3.7 billion from paper and allied industries (Update of Ex. 191, p. 50, MNR Question 10). OFIA supported those figures, but estimated that the forest services sector contributed about \$125 million in value-added not counted by MNR (Update of Ex. 1046, p. 11, OFIA Question 4).

Figure 9.2
Direct Employment Related to
The Ontario Forest Products Industry - 1989

Sector/Subsector	Number of Workers Directly Employed in the Ontario Forest Products Industry - 1989
Logging	7,756
Wood Industries	
Sawmills and Planing Mills	7,486
Veneer and Plywood Industry	2,184
Sash, Door and Other Millwork	16,048
Wooden Box and Pallet Industry	1,763
Other Wood Industries	3,174
Total	30,655
Paper and Allied Industries	
Pulp and Paper Industries	19,758
Asphalt Roofing Manufacturers	548
Paper, Box and Bag Manufacturers	11,430
Other Converted Paper Products	10,597
Total	42,333
Total/Overall	80,744
Source: Update of Ex. 191, p. 65, MNR Question 12	

IMPORTANCE OF THE FOREST INDUSTRY TO ONTARIO

The forest products industry accounted for about 2% of total employment in Ontario in 1981, and about 6.4% of the goods-producing labour force that year (Ex. 191, p. 49). These employees are generally well-paid. A study for OFIA by economist Cam N. Watson found average incomes in 1985 of \$27,890 for forestry and logging, \$22,356 for wood processing and \$31,599 for pulp and paper. By contrast, tourism-related occupations had annual incomes of about \$14,000 to \$16,000, Mr. Watson said (trans: vol. 184, p. 32292). Calculating by a different method, a study for the Ministry of Tourism and Recreation in 1988 found an average annual salary in the tourism sector of even less, about \$11,300 (trans: vol. 172, p. 30578). Another OFIA witness, Michael Ross, estimated that between 70% and 83% of all tourism expenditures came from people – such as business travellers, shoppers and people visiting friends or relatives – whose tourism spending was not connected with

enjoyment of the natural environment (Ex. 1046, p. 54). Mr. Ross also estimated that 36,000 people were employed by the forest industry in the area of the undertaking, compared with 29,000 in mining and about 27,000 in tourism (trans: vol. 184, p. 32351).

Direct employment and wage figures, however, understate the full contribution of the forest industry to our province. MNR economist Alison Coke explained how statistical "multipliers" can estimate the number of "spin-off" jobs linked to the forest industry. These include both "indirect" jobs involved in supplying goods and services to the industry and "induced" jobs sustained when forest industry employees spend their paychecks. Using the 1989 employment figures, the multiplier ratios could be used to estimate that the 80,744 direct jobs in Ontario's forest products industry generated an additional 88,800 spin-off jobs in Ontario, for a total of about 169,500 (Update of Ex. 1046, p. 19, OFIA Question 5).

Mr. Ross, for OFIA, calculated that if the 6,460 employees of the forestry service sector were added, along with an appropriate multiplier, the total employment generated by the forest industry in Ontario, including direct, indirect and induced effects, would be 182,500 for 1989. The industry's capital expenditures, Mr. Ross said, may have added another 12,400 jobs, for a grand total of 194,900 (Update of Ex. 1046, p. 19, OFIA Question 5).

OFIA also called attention to the significant number of small businesses involved in logging and wood industries in Northern Ontario. Based on 1986 figures, 92% of logging establishments and 72% of establishments in the wood industries employed fewer than 50 people. Large enterprises are more dominant in the paper and allied industries, where 37% of the establishments in the area of the undertaking had at least 500 employees.

Demand for forest products can swing sharply with business cycles, making job prospects in Northern Ontario sensitive to ups and downs in North American newspaper circulation and new home starts, to name two factors. This has been evident in the course of this hearing, which has seen the forest industry through years of boom, recession and what appears to be the beginning of recovery. But a comparison with other industries prepared for OFIA showed forest products employment in Ontario was no more cyclical than mining and somewhat less than cyclical than auto manufacturing during the 1970s and early 1980s (Ex. 1046, p. 42). The OFIA study also found that labour productivity increased 35% in the forest industry during that 15-year period, including a striking 97% increase for the logging sector, which was moving toward greater mechanization.

FFT, in its Panel 7, suggested that the evidence points to nearly inevitable decline for the forest products industry in Ontario, with decreases in employment and available timber. Dr. Peter Morrison testified that increase productivity has led to employment drops in all sectors

of the industry. We were not persuaded by FFT's evidence, described in Chapter 5 (p. 155), predicting timber supply shortages in Ontario. Better productivity has reduced the need for some workers, in a trend that is likely to continue. But we believe the challenges facing forestry in Ontario can and should be faced by the government, the private sector or both together in an effort to better the socio-economic condition of the population, especially those living in the North. On p. 335, we recommend government look into ways to increase the amount of secondary manufacturing in the area of the undertaking.

The forest industry also provided a comparison of its annual payments for stumpage charges and federal and provincial taxes against the Ontario government's expenditures on forest management. For the 1983-84 fiscal year, the industry paid \$255 million in all taxes, stumpage and area charges and also spent \$32 million on forest management, while the federal and provincial governments spent \$260 million on forest management. Mr. Ross said this showed that "in 1983/84 the forest industry contributed, directly or indirectly, approximately \$30 million more than governments spent on forest management activities within the Area of the Undertaking" (Ex. 1046, p. 24). In 1985/86, Mr. Ross said, the gap was about \$60 million, and he said forest industry payments to government probably increased in the late 1980s because of the tax on softwood lumber exports, increased stumpage rates and favourable market conditions for the industry, which was then enjoying a boom. Updated statistics from OFIA for 1990 showed industry paying \$715 million in taxes, stumpage and area charges and \$56 million on forest management, while the government spent \$321 million on forest management (Update of Ex. 1046, p. 24, OFIA Question 8).

Counsel for MOEE (trans: vol. 186, pp. 32693-702) and for FFT (trans: vol. 185, pp. 32498-502) challenged this interpretation in cross-examination, pointing out that the amounts the forest industry paid directly for access to timber – the stumpage and area fees – fell far short of matching government spending on forest management. Mr. Ross replied that the comparison was made to illuminate the question of "what would happen if there were not a forest industry, how much less would be spent on forest management, how much less would be paid by the forest industry to government, how much less would be paid by governments to the industry" (trans: vol. 186, p. 32697).

The industry's corporate income and sales taxes and employees' personal income taxes to the provincial and federal governments cannot be credited directly against public expenditures on forest management. Governments have a wide range of responsibilities – including social services, health care, education and the like in Northern Ontario – which must be funded out of general revenue, including taxes on the forest industry. The issue of

how much the forest industry is paying its own way and how much its operations are subsidized by government is a much broader question.

The evidence on the forest industry's socio-economic impact demonstrates that this industry makes a major contribution to Ontario and is absolutely vital for the North. But the current situation still leaves us uneasy. The people of the province are the owners of this resource, but public revenues from the harvest do not even cover government costs. However, the indirect benefits are extensive, as MNR forester Peter Hynard explained:

Private landowners do not invest in forestry to a large degree because the rate of return is simply too low. And the government of Ontario, on the other hand, invests in forestry because the benefits to Ontario society from a cord of wood are enormous. Those benefits include people working in the mills, they are paying their taxes, they are not collecting unemployment insurance, they are buying their skidders that are made in Woodstock, they are buying their Chevrolets that are made in Oshawa. Those are all values that Ontario society – people of Ontario receive as a result of the government of Ontario making this investment.

(trans: vol. 78, p. 13076)

It would obviously be preferable if the stumpage and other charges to the industry were enough to cover the government's direct costs in forest management, but we are not prepared to order this in our Conditions of Approval. We did not receive clear evidence of what the effects of higher stumpage rates might be, and do not want to risk, for instance, forcing mill closures as the price of finding out. Also, stumpage fees are matters regulated by the *Crown Timber Act*. As discussed below, we are greatly concerned about the distribution of benefits between Northern and Southern Ontario and make recommendations on p. 335.

BENEFITS TO NORTHERN ONTARIO

The evidence before this hearing, from the experts' statistical tables to the anecdotal accounts we heard in visits to 15 communities, made clear the overwhelming importance of the forest industry to the North. Economist Cam Watson, testifying for OFIA, estimated that nearly two-thirds of the population of Northern Ontario in 1986 lived in communities where at least 2% of the workforce was employed in the forest industry (Ex. 1045, pp. 3-23). Mayor Ken Buck of Espanola emphasized how important the E.B. Eddy mill is to his community, paying 58.53% of the total local tax bill:

So if this mill goes down we all go down: the business closes shop, their buildings revert to residential assessment and after three years if no taxes are paid, the town can take the property back for back taxes and who wants that? I don't and I'm sure you people do not either.

(trans: vol. 231, p. 42028)

If Northern Ontario benefits greatly from the forest industry, there are still reasons to believe it could do better. One study, prepared for MNR, found that in 1976 only 2% of the forest industry's purchases of supplies, equipment and services (not counting the wood) came from Northern Ontario, while 46% came from Southern Ontario and 52% from outside the province. This suggests that the private sector has a role to play in supporting the area it depends on for wood by making more purchases locally.

More jobs are clearly needed in Northern Ontario, especially so that the region's young people can stay in the north. The 1986 census showed the population of Northern Ontario had declined 3.2% in the previous five years, while the population of Southern Ontario grew 5.7% (Ex. 207, p. 105).

Overall, while a 1982 survey found more than 96% of the logging jobs were in Northern Ontario (Ex. 191, p. 130), most of the employment from secondary manufacturing was in Southern Ontario. A table supplied by MNR (Ex. 191, p. 122), based on 1983 figures, showed a total of 59,128 jobs in Ontario in all wood and paper and allied industries. Of these, 38,398 or 65% were in Central, Eastern or Southwestern Ontario. A large portion of these jobs involve secondary conversion, such as production of bags, boxes and envelopes, and are concentrated in the more populous regions of the province.

MNR emphasized that the forest industry provides 85% of manufacturing jobs in Northwestern Ontario and 35% percent of manufacturing jobs in Northeastern Ontario (Ex. 191, p. 123). But this merely underscores how little manufacturing of any sort there is in the part of Ontario where the forest resource is located. Even in southern Ontario, with its broad base of other industries, forest products accounted for 5.2% of total manufacturing employment in 1983 (Ex. 191, p. 129).

These figures suggest that the socio-economic environment of the Area of the Undertaking would be significantly improved if more secondary manufacturing of forest products occurred closer to where the trees are grown and cut. IWA-Canada, a trade union representing workers in the industry, suggested lower stumpage rates for timber that undergoes three or four processing steps in Canada. (trans: vol. 378, p. 65529). We believe these kinds of ideas should be explored to encourage industrial development in Northern Ontario, and we

recommend that the provincial government conduct an analysis of how best to accomplish this goal. Secondary manufacturing employment in the forest industries holds a much higher promise for the residents of Northern Ontario than the prospect of more seasonal, low-paying tourism jobs promoted by some parties at this hearing. Tourism remains, however, an important sector of the Northern economy, as we discuss later in this chapter.

Mr. Watson's study found that the forest industry was responsible for 29,840 jobs in more than 300 establishments in Northern Ontario in 1986, or 8.9% of the total employment in the region (Ex. 1045, pp. 2-6). The study deals separately with the "Near North," which is basically the portion of the area of the undertaking south of Parry Sound and Nipissing. In the Near North, the forest industry had 3,655 jobs in 210 establishments or 3.6% of total employment.

Mr. Watson analyzed 278 communities in Northern Ontario, dividing them into four categories according to how dependent they were on the forest industry. He found nine communities with 40% or more of the labour force working in the forest industry, 61 communities with 15.0% to 39.9%, 56 communities with 2.0% to 14.9% and 140 communities with less than 2.0% of the labour force in the forest industry. The communities in the first three categories were home to almost 63% of the region's population (Ex. 1045, pp. 3-12).

The study found that forestry communities in Northern Ontario tended to be wealthier and healthier than the non-forestry communities, were less dependent on public funding, had lower unemployment and higher labour force participation rates, had a much stronger industrial and commercial tax base, had larger families and a higher rate of home ownership.

Mr. Watson's examination of the incomes of 21,560 forestry workers and 124,365 non-forestry workers in 30 communities in Northern Ontario came to the conclusion that the average worker in the forest industry earned 35% to 40% more. In the non-forestry sector, 57.2% of all incomes were below \$20,000, which was true for only 23.7% in forestry. On the other side of the scale, 55.6% of forestry incomes were greater than \$30,000, compared with 24.2% of non-forestry incomes (Ex. 1045, pp. 4-19).

The situation in the Near North was very different. Out of 111 communities, one had 40% or more of the labour force in the forest industry, 17 had 15.0% to 39.9%, 43 had 2.0 to 14.9% and 50 had less than 2.0% (Ex. 1045, pp. 3-27). The forestry communities averaged lower incomes, higher unemployment, lower house values and higher government transfer payments. Mr. Watson offered two explanations: the Near North relies heavily on the wood

industries, which offer lower incomes than logging or pulp and paper; and non-forestry communities in the Near North tend to have greater economic strengths than non-forestry communities farther north.

Mr. Watson's study included a more intensive field examination of three forestry-dependent communities in Northern Ontario: Chapleau, Dryden and Ear Falls. Dryden's economy was dominated by a pulp and paper mill and Chapleau's by wood industries, while the forestry labour force in Ear Falls mostly worked in logging and forestry services. Ear Falls was suffering from the recent closure of an iron ore mine which had employed 550 people in a community of just under 1,500 population.

This evidence made vividly clear how much a community can benefit from the presence of pulp mills or sawmills. Mr. Watson estimated that over 40% of Chapleau's property tax base was dependent on the forest industry. In Dryden, the study found the forest industry represented 82% of non-residential assessment in a community where residential assessment was about 30% of the total. Mr. Watson's evidence on Ear Falls did not estimate how much of the tax base was linked to forestry, but it did show how the mine closing led to a dramatic increase in residential property taxes, while driving housing prices down.

Several witnesses from Red Lake provided more evidence of the problems facing a town where many people are employed in logging or other forestry jobs, but there is no mill to bear a heavy portion of the local tax load. Dave McLeod, school board director in Red Lake, said his community cannot afford to offer the kinds of programs available in Kenora or Dryden, including courses students need to prepare for university (trans: vol. 308, p. 54811). Pat Sayeau, former president of the Red Lake Chamber of Commerce, told the hearing that "those communities which are involved in the extraction of the forest resource do not benefit from the resource wealth to the same extent as the processing communities" (trans: vol. 141, pp. 24038-39). Sayeau said Red Lake and other harvesting communities have less money to spend on streets, curbs, recreation centres, storm sewers and other municipal services.

Hugh Carlson, the reeve of Red Lake township, said his community had the highest municipal tax rate in the region, but a lower level of services, notably "poor-man's pavement" on most local roads.

If you go to Kenora, Dryden, Fort Frances, you see a lot of pavement around there. It's just that they obviously have a larger tax base, and the difference is that they have the mill, the big tax contributor and it shows in the rates that the

citizens have to pay for municipal taxes and it also shows in the level of facilities in the communities.

(trans: vol. 308, p. 54785)

We believe that logging communities should receive a fair share of the rewards from the use of Ontario's timber resource, and we address this issue in the recommendations which follow.

Recommendations

1. Although nearly all harvesting in Ontario occurs in Northern Ontario, the evidence at this hearing was that only about 35% of all jobs in the forest industry were in the North. We believe government should be studying the potential for economic development of industry related to timber harvest nearer the supply of fibre. Northern Ontario has a history of one-industry towns in serious trouble or even shutting down, while at the same time large amounts of fibre leave the area to be processed or manufactured in Southern Ontario.
2. We were favourably impressed by the IWA's suggestion that stumpage rates should be lowered for timber that undergoes three or four processing steps in Canada. We believe the Ontario government should investigate the possibility of introducing this concept, and possibly take it a step further to encourage further processing or manufacturing in the area of the undertaking.
3. In 1972, a study of purchases by the forest industry of supplies, equipment and services found that only 2% occurred in Northern Ontario. We recommend that the Ontario government update this information to determine if this is still true. We believe government should work with the private sector to determine if more forest industry supplies could be purchased in the North. The government and private sector should also look at the possibility of import replacement by manufacturing more forestry equipment in Ontario, and preferably in Northern Ontario near the market.
4. We believe the government must undertake a study to determine the best way to provide relief to logging communities, which have higher municipal and educational taxes than major mill towns but a lower level of services. It should consider returning a portion of stumpage fees to the area or some means of allowing logging towns to share some of the taxes from towns to which the wood from their area is delivered, such as a form of regional government.

STAKEHOLDERS

The uncontested evidence is that the forest industry provides a substantial benefit to the general socio-economic environment of Ontario, and even more so to Northern Ontario and

specifically to the area of the undertaking. But we must also look carefully at certain groups or industries whose economic interests are put at risk by the undertaking, in part to determine how timber management can be structured so that these effects can be minimized or mitigated. It is also important to recognize that many Ontarians feel strongly about the non-economic values of the forest. Witnesses told us they see the forest as a heritage resource they would like to see in as natural a state as possible. Our conditions on old growth, wilderness areas and protection of non-timber values address some of their concerns. Many individuals and organizations put their concerns as stakeholders before us as witnesses at our community hearings. Their names can be found in the Witness List at the end of this decision. Several important groups were parties to the hearing, and had a chance to present evidence and cross-examine witnesses.

MNR described the impacts on a wide range of commercial and recreational stakeholders in its Panel 10 witness statement (Ex. 416B, pp. 945-1034). It dealt with:

- The mining industry
- Commercial tourist operators
- Trappers
- Wild Rice Harvesters
- Commercial Food Fishermen
- Bait Fishermen
- Forest Products Industry
- Agriculture Industry
- Cottagers
- Naturalists
- Anglers
- Hunters
- Canoeists
- Hikers
- Park users
- Local communities
- Native people
- General public

The ministry's assessment of the effects on these groups was presented more concisely in Ex. 469, Summary of Effects of Timber Management Operations on the Socio-Economic Environment. In general, timber management can have a broad range of positive or negative effects, depending on how it is done. The planning process and the public consultation process we are ordering in our Conditions of Approval are designed to prevent, reduce or mitigate the negative effects as much as possible. These processes afford stakeholders an opportunity to take part in timber management planning, to influence decisions and to ensure all interests are protected. They are discussed in more detail in

Chapter 3, where we spell out the requirements of public consultation and the Area of Concern planning procedures, and in Chapter 8, where we describe how MNR's implementation manuals will be employed. We found MNR's presentation thorough and acceptable for most groups, but the following deserve more detailed consideration:

Aboriginal Communities

The First Nations and Aboriginal peoples in Northern Ontario have an enormous stake in timber management, because of their historical dependence on the forest and because obtaining more of the benefits of the forest could provide hope for bettering their current economic situation. In recognition that these peoples are far more than just another stakeholder in the process, we have devoted Chapter 10 (pp. 345-376) to the evidence we received on this subject and an explanation of our findings.

Tourism

The tourist industry deserves special attention, because the negative effects of timber management can be especially severe on the economic interests of specific tourist operators: remote outpost tourism, road access tourism and venture tourism. Each of these could face different problems as a result of timber management.

Remote outposts charge premium prices for a special experience, usually on a lake accessible only by plane. A report prepared for the Ontario Ministry of Tourism and Recreation described how remote tourism business in the study area near Rowan Lake in Northwestern Ontario was beginning to suffer because of:

permanent forestry road access development with its potential for facilitating vehicle and hence sport fishing and hunting access (i.e., competition); for noise impacts from road building, cutting operations and timber hauling; for visual intrusion upon shorelines and aerial flight paths; and for other user contact upon fly-in lakes.

(Ex. 2136, p. i)

Several examples of these effects were assembled by the Northern Ontario Tourist Outfitters Association in Ex. 2138, Forestry Impacts on Remote Tourism.

Bud Dickson, president of Canoe Canada Outfitters Inc. in Atikokan, told the hearing how the livelihood of an outpost operator can be threatened if the experience being sold to tourists is diminished:

You can offer a tremendous service, you can have the highest quality equipment, but if you don't have a resource to work with, you're going to be in trouble. And it's because – as one operator said, we should be a featured species but rather we're an endangered species, and the future for our industry, as things now stand, is very scary. And traditionally the forest management practices of this province have not treated us kindly, they have been very insensitive, they haven't recognized our true value to the community as a whole, they've worked with us and often times we may see it as tokenism. When mistakes have been made, misunderstandings have happened, it's usually the operator that pays a price or suffers. It's kind of like we get bullied along by the big bully.

(trans: vol. 360, p. 62665)

Mr. Dickson also described how improved access to the area of a remote camp can lead to vandalism and theft, as well as increased pressure on local populations of fish and moose. Cross-examined by counsel for FFT, Mr. Dickson acknowledged that protecting remote tourism might involve "not just better planning where a road goes, but a reduction or a change in allocations, the forest industry extraction itself" (trans: vol. 361, p. 63027).

Other remote outpost operators told us they could live with logging near their camps, especially if it is done in winter, but cannot survive road access to their lakes. Bernie Cox, for instance, owner of a fly-in fishing operation, told us at the Fort Frances community hearing:

If they cut to the lake and went out on the islands and cut the trees off the islands and completely balded everything right off and took the roads out and gave me remoteness, I could still sell it, I'd still be in business, but having the access, the constant access just hurts the fishery so bad that I can't sell it any more.

(trans: vol. 205, p. 36608)

We made many requests to the OFAH/NOTOA Coalition for complete and recent information about how many remote tourist operators in fact have been forced out of business because of timber management. The response however, notably Ex. 2138 and Ex. 2151, amounted to complaints going back many years but no indication of businesses being lost. The long-term monitoring studies MNR will conduct on effects of the Tourism Guidelines (discussed in Chapter 8, p. 306) can be expected to yield better information on the problems faced by remote operators.

Tourist operations whose customers arrive by road share some, but not all, of the concerns of the remote outposts. The drive-in operators depend less on remoteness, and may even

benefit from better access. However, noise during harvest and road construction, deterioration of fishing near harvest areas and the loss of visual appeal in a cutover area, for example, affect both kinds of operations. The aesthetic impact of logging is especially acute when the cutover can be seen from a tourist lake.

Venture tourism operators would outfit, transport and guide a group of people on a canoeing or hiking trip to the back country, usually without any need for a permanent camp or lodge. Dan King, representing the Venture Tourism Association, said this industry usually has little impact on the landscape and involves low capital expenditures. It is easier for them than for other tourist operators to switch to another area to get away from a timber harvest site. But he said these operators usually find it very difficult to participate in the timber management planning process (trans: vol. 395, p. 67938). Venture Tourism's evidence focused on the value of careful planning to limit the visual effects of timber harvest and the effects on portage routes. This helped us in our decision to order Condition 24 on Visual Resources, explained more fully in Chapter 11 at p. 406. This kind of adventure tourism could prove an increasingly popular draw for tourists from Europe and other countries (trans: vol. 252, p. 45350).

MNR depends on the Timber Management Guidelines for the Protection of Tourism Values (Ex. 379) to try to prevent or minimize harm to all kinds of tourist operations, largely through protecting the visual appeal of forest landscapes. Other guidelines protecting moose and fish habitat also come into play. Details of MNR's approach to protecting commercial tourist operators are spelled out in Ex. 416b, pp. 957-981, and in the evidence of MNR witness Cam Clark (trans: vol. 82, pp 13677-786.) The Guidelines for the Protection of Tourism Values require timber management planners to consult with tourist operators, and under our Condition 36, if there is any disagreement on how to deal with the tourism concern, this must be spelled out in the Plan.

Mr. Dickson told us many tourist operators are encouraged by MNR's recent initiatives, but also fear that the progress was the result of this hearing and might not continue once the hearing was concluded (trans: vol. 362, p. 63268). We are confident that our terms and conditions of approval will ensure that this process does not stop. We rely especially on the Local Citizens Committee, which will have a representative on the planning team for each Timber Management Plan. This committee will ensure that public consultation is always a part of MNR's planning and that the concerns of all interested groups are taken into account. With this expanded public involvement, MNR's tourism guidelines and other conditions we have ordered such as limits on road access to remote tourism areas (Chapter 4, p. 137) it is our view that most negative effects of timber management on tourism can be mitigated.

Trappers

Trappers are especially vulnerable to any disruption in the forest, and should be given careful consideration in timber management planning. In 1985-86, there were 17,500 trapping licenses in Ontario, although not all of these were in Northern Ontario (Ex. 209, p. 104). Trappers that year took in \$15 million at fur sales. Trappers appeared at our community hearings, offering important insights into their situation. Fred Bergman, for example, told us at Red Lake:

A good trapper, and I think my sons and I are, we control the amount of animals we take and logging certainly does devastate our plans, but our biggest problem has been – well, as an example, when the snow was still on the ground we went out to our trap line, I forget how long ago it was, maybe a few months ago, but we broke trails with the snow machines. It can be in itself a pretty hairy set up and we went back a couple of days later and a logger deliberately took his skidder and zig-zagged back and forth across our trails again and again and destroyed everything. We couldn't get into our trap lines.

(trans: vol. 307, p. 54495)

Mr. Bergman urged stricter enforcement by MNR of logging infractions. He also acknowledged, however, that at times "it may even be to the trapper's advantage to cut it right to the logging line, then a new growth of tag alders and whatnot come up and there is better feed for your beaver" (trans: vol. 307, p. 54496-97).

Craig MacDonald, an MNR recreation specialist called by Venture Tourism, told us the ministry often "will have complaints from the trappers about the condition of the portage systems and the trapline trails after a logging operation has gone through."

MNR said in its evidence that it tries to "plan access corridors to improve utilization and management of traplines" and wants to encourage consultation between logging companies and trappers (Ex. 406B, pp. 983-84). We heard enough evidence of the failure of these efforts to protect trappers, however, to warrant Condition 76, specifically requiring MNR to make sure logging operators help reopen the trails used in working traplines after harvest. Also, we received complaints from tourist operators and canoeists about timber operations obstructing portages and this condition also applies to these situations.

SOCIO-ECONOMIC ANALYSIS

Two parties at the hearing, FFT and the OFAH/NOTOA Coalition, asked us to require MNR to adopt sophisticated new tools of socio-economic analysis as part of decision-making

in drawing up Timber Management Plans. We heard several witnesses describe the work that has been done recently in developing these methodologies, much of it in the United States. Early in the hearing, it became clear to us that MNR did not rely on socio-economic analyses on a regular basis, although MNR forester Peter Hynard described for us the kind of financial analysis used when Plans are prepared.

Cam Clark, MNR's project manager for this hearing, said the tools used in timber management can range from highly sophisticated studies such as the Lake of the Woods socio-economic impact analysis that was done in the 1980s (trans: vol. 104, p. 17459) to very detailed site-specific analysis such as the Lac Saul ferry proposal (trans: vol. 104, p. 17460). Mr. Clark said the problems faced by foresters in normal planning usually can be solved without sophisticated socio-economic tools (trans: vol. 104, p. 17478).

Later in the hearing, MNR proposed to investigate within two years available analytical methods that might be useful for timber management in Ontario, and to develop or adopt appropriate methodologies. FFT urged that MNR be required to conduct cost-benefit analyses as part of the timber management planning process. Our discussion of this topic, and the reasons we were not prepared to accept this proposal, are in Chapter 5, p. 199.

Peter Victor and Atif Kubursi, witnesses for the Coalition, described several techniques for estimating the non-timber values of forests in economic terms and for estimating the economic impacts associated with expenditures on tourism and recreation. Dr. Victor spoke to economic value, which is used to measure the significance of activities usually measured in dollars. One methodology available for measuring non-timber values can be classified as market-based (i.e., travel cost studies), in which expenditures on recreation are measured. Dr. Victor provided evidence of several travel-cost studies used to estimate the value of recreation in the United States. One such study, by Bowes and Krutella in New Hampshire and Maine, indicated that annual net value of recreation per acre of land was more than double the net value of timber. Because these studies were based on the larger population living near U.S. forests, they cannot be applied without modification to timber management planning in Ontario. What is paramount is that we have the information on which to make informed decisions. In addition, contingent valuation, a method for directly eliciting people's preference, might be used to assist when trying to measure non-timber values that do not have any market value. One example is called "willingness to pay."

It is also important that non-timber values be protected from timber operations, even if they cannot be shown to be worth more money than the timber. For example, Gordon Pyzer, an MNR forester and district manager, argued that an outpost camp worth \$5,000 should not go unprotected during road-building operations because its economic value is small

when weighed against the economic benefits of a multi-billion dollar forest company (trans: vol. 133, p. 22612). We also heard evidence from Neville Ward, a fisheries biologist, that MNR treats recreational fishing as an inherent value to be protected even if its economic value cannot be proven (trans: vol. 134, p. 22809).

Dr. Victor also provided a six-point plan for MNR to make progress towards economic valuation (Ex. 2113, p. 27). In Reply evidence, MNR witness Laurie Gravelines indicated that the Ministry agreed with much of the list, but disagreed with how to proceed. He further indicated that MNR was already trying to do some of the things Dr. Victor was suggesting as part of their Forest Values Program (trans: vol. 392, pp. 67597-601). MNR disagreed with Dr. Victor's suggestion that generic estimates of non-timber values developed in the U.S. could be used in Ontario. We agree with MNR that results of the Bowes and Krutella study should not be applied without modification to the area of the undertaking.

Dr. Kubursi, on behalf of the Coalition, also described different tools for economic impact analyses which it believes should be used in conjunction with economic valuation. Dr. Kubursi supported the use of input/output analysis to track the flow of economic activities. By analyzing the input/output matrix of economic activities and changing the demands for outputs, implications could be identified and predicted. He also described econometric models. Both of these could be used to estimate the economic impact on various industries of proposed timber management activities. For example, Dr. Kubursi indicated that changes in tourism activities due to timber management can be input into economic impact analysis models to forecast local and regional economic impacts. The impacts can be expressed in terms of jobs, revenues, government taxes and various other measures of economic activity. Dr. Kubursi indicated his studies show that tourism has a major economic impact on northern communities and that in all timber management planning an environmental impact analysis should be done to obtain the appropriate balance between economic impacts on the tourist industry and forest industry.

The Coalition, in its proposed terms and conditions, urged us to set a three-year deadline for MNR to develop or adopt the new techniques it is committed to studying over the next two years. We do not believe it is reasonable to set such an early deadline for implementation at the management unit level. We are encouraged, however, that MNR has hired Dr. Kubursi to pursue some of the work he described at this hearing. We do believe that non-timber values must be determined and used in timber management planning to achieve the best overall combination of timber and non-timber uses. We agree that MNR must identify appropriate methodologies for estimating values, including non-market values through travel cost analyses and contingent valuation methods such as willingness to pay, using Ontario data. Therefore the Board is ordering Condition 104, adopting MNR's

proposal, including the two-year time limit for preparing methodologies to fit the Ontario situation. MNR must report its progress in this effort through the Annual Report to the Legislature (Appendix 20) and to MOEE (Appendix 114).

104. Within two years of this approval, MNR shall investigate available analytical methods for assessing social and economic advantages and disadvantages and their applicability to Ontario's timber management operations, and shall develop or adopt appropriate methodologies for use in timber management planning.

Another party that addressed socio-economic issues was the Canadian Association of Single Industry Towns (CASIT). While it made no attempt to identify any sophisticated analyses that might be utilized by MNR, CASIT made a compelling case based on the experience of living in the north, assisting in the extraction of the timber and then watching with dismay how little of the benefits remained in their area. CASIT witnesses saw little in the way of access planning which might lead to future development. They saw little opportunity for input into maximizing the job opportunity and purchasing possibilities involved in Timber Management. Finally, they saw little returning to the area, including taxes from the industry through the province or stumpage, which could be helpful on providing some relief from high education tax or to enhance the standard of living in these communities.

While the timber management planning process might not be the appropriate vehicle to address their concerns, we heard the CASIT witnesses loud and clear. In addition to supporting their proposal for socio-economic analyses, we are urging the province to establish a task force to study the problem of "timber towns" and urging the government to find a better way to return tax dollars to the area to reduce the heavy burden of property tax and education tax and to improve delivery of services.

CHAPTER 10

FIRST NATIONS AND ABORIGINAL COMMUNITIES

INTRODUCTION

Timber management operations unquestionably affect First Nations and Aboriginal communities, and the timber management planning process offers a chance to better their economic condition. Four intervenor groups represented the interests of these communities and were prominent participants at the hearing. Grand Council Treaty #3 (GCT #3), Nishnawbe-Aski Nation/Windigo Tribal Council (NAN/Windigo), the Ontario Metis and Aboriginal Association (OMAA) and the North Shore Tribal Council, United Chiefs and Councils of Manitoulin and Union of Ontario Indians in partnership with the Northwatch Coalition. These four groups were full-time parties who received intervenor funding and were represented by counsel. They presented their own cases and the witnesses who testified for them at various locations are identified in the Witness List. Others gave individual submissions at the community hearings, including Chief Wendall Froman of the Six Nations Iroquois Confederacy, Chief Fred Wapachee of the Moose Factory First Nation and several witnesses for the Teme-Augama Anishnawbe First Nation.

GCT #3, representing 25 communities, provided us with approximate on-reserve population figures from Statistics Canada, which the chiefs who were asked said seem to be reasonably accurate. The total on-reserve population of GCT #3 First Nations in 1990 was 12,086 (Ex. 1867).

The Nishnawbe-Aski Nation is comprised of forty-eight First Nations, including those of the Windigo Tribal Council. Grand Chief Bentley Cheechoo told us that the total NAN population is estimated to be around 31,000, but that only 15 or 16 of their communities are in the Area of the Undertaking (trans: vol. 330, pp. 58008-9). The Windigo Tribal Council is one of six tribal councils that are members of NAN. Windigo Tribal Council is made up of seven communities, with a total population of about 2,000 people. Of Windigo's seven communities, two are situated within and two just north of the Area of the Undertaking.

OMAA claimed to represent 200,000 Indian and Metis peoples living off-reserve in Ontario (Ex. 1914). While no thorough enumeration has been conducted for OMAA's constituency, the association estimated it had 15,000 to 20,000 "card-carrying" members (Ex. 1916).

We received various estimates of the size of the Aboriginal population but John Kenrick testified for MNR on native population data from the 1981 census, which indicates that there were 110,550 native people living in Ontario and 35,000 in the area of the undertaking (trans: vol. 43, p. 7267). This counted people registered under the *Indian Act* or who self-identified in the census. He said that native people account for 3.5% of the population in the area of the undertaking, although the percentage is much higher in some areas. (For example, native people account for 27% of Kenora's population, 10% of Rainy River's population, and 31% of Manitoulin's (trans: vol. 46)).

MNR described persons and groups with an interest in timber management planning as "stakeholders" and divided them into four categories: commercial, recreational, local and traditional users and the general public. The category of local and traditional users was further divided into two groups: all local northern Ontario residents and native peoples. We are persuaded by the evidence we heard that it is incorrect to characterize the interests of First Nations and Aboriginal peoples as being the same as that of other stakeholders. In this chapter, we consider the impacts of timber management planning, both those experienced by other forest users and those unique to reserve communities. We discuss our findings that First Nations and Aboriginal peoples should, but do not, have the same access to the benefits of timber management planning as do other northern communities and forest users in the area of the undertaking. This exclusion has developed as a result of historical circumstances and ongoing uncertainty about the meaning and definition of Treaty and Aboriginal Rights. We disagree with MNR that access to the social and economic benefits of timber management planning, which was called the "allocation" issue at the hearing, is entirely outside of our consideration.

At the beginning of the hearing, Chief George Kakeway, Chief of the Lac Portage Band and a member of the Executive Council of GCT #3 described for us the interests of his communities in Timber Management Planning and we repeat his words here as an instructive context for understanding the viewpoint of native peoples:

Our population is approximately 12,000 and, therefore, if we all lived in one place our population centre would be larger than Kenora, Fort Frances or Dryden.

But we do not live in one place and, in fact, our people are widely scattered, most living in small reserve communities on the lakes and the forests. This is the main reason why we are before this tribunal. **We are the people who will be most directly affected by your decisions. Everyone else who is here can and will go elsewhere if they can't get what they want from the forests.**

The big corporations will invest their money in some other business, the recreationalists will find some other place to visit, the forest industry employees will move down the road if they lose their incomes. But we, the Ojibways, are not transients in the land for this is our permanent home.

If, as a result of these hearings, damage to our home is repaired, future damage is prevented and we are able to share some of the prosperities from forest, then we will enjoy the benefits. If none of these happen, we will still stay here. That is the difference between my people and all or most of the others who will come before this hearing.

In the Treaty 3 Territory, we were the first timber managers. Just past the middle of the last century when settlers and soldiers travelled through our territory heading for the west they needed wood, especially for the steamboats.

Some of our people made good living cutting and selling wood in this manner and when we were negotiating the treaty we would not sign until unpaid debts for this wood were honoured.

When the treaty was made, nothing was said about the white man suddenly owning all the timber, but immediately after the treaty, as soon as the railway came through, with the railway came big timber companies from the east well-connected politically and with thousands of immigrants working to cut the forests down. Not only did we gain little or no benefit, but great lots of the best wood were taken out.

Even our own reserves were invaded by these timber companies in the belief their political friends would protect them. One of our bands just this month is finally receiving partial compensation for an enormous timber cutting trespass which occurred more than a hundred years ago.

My people believed at the time the treaty was made, and we still believe, that the agreement in the treaty was to permit Europeans to enter our territory and share the use of the land, sharing and mutual respect are central aspects of the Ojibway belief system.

(trans: vol. 2, pp. 249-51)

THE PAST

Grand Council Treaty #3

We wanted to understand how Aboriginal people in Northern Ontario, who lived in the forest for hundreds of years before European settlement, came to be shut out of the economic benefits of forestry enjoyed by other northern communities. The evidence of Tim

Holzkamm and Leo Waisberg, ethnohistorians called as expert witnesses by GCT #3, was particularly helpful in providing historical explanations for this exclusion. Ethnohistory combines the studies of anthropology and history and these witnesses are dedicated to recovering the history of the Ojibway people of Northwestern Ontario, who did not leave behind their own written account.

The Ojibway economy at the time of first contact with white men in the early 1700s and continuing essentially to the time of treaty was diversified and relied on a wide range of resources both grown and natural (trans. vol. 312, p. 55192). The Ojibway people relied entirely on the forest for their traditional existence and economy. It was the prime source of their raw materials: wild rice, maple sugar, fruits, nuts, berries, roots, medicinal plants, birch bark for canoes, fishing and hunting implements and items for trade.

The witnesses described for us how the Ojibway were exposed to Euro-Canadian exploitation of the forest and became involved in its economy. The fur trade became significant in 1775 and the Ojibways also sold or bartered their wild rice, fish, produce and canoes to the traders. After 1805 the Ojibway nations became more reliant on agriculture and its importance increased throughout the nineteenth century. One of the markets established by the Ojibway for their garden produce was the logging industry.

The Ojibway harvested large but sustainable amounts of sturgeon, one of their most important resources, in the Rainy River area. We were told that with the opening of the sturgeon fishery to non-Indian commercial fishing in the 1880's the resource was overfished and by 1900 had collapsed.

Construction of dams in the late 1800s caused serious flooding problems for the Ojibway communities (trans: vol. 313, pp. 55399-400). These events deprived them of traditional sources of food and activities in agriculture and fishing. We were also told of how the Ojibway were eventually forced off their agricultural land by white settlers. In one example, Chief Wilson told us that seven communities living along the Rainy River from Fort Frances to the Lake of the Woods were forced off those lands into one community called the Manitou Reserve (trans: vol. 315, p. 55649).

During the 1870's, treaties were signed which saw the Ojibway exchange lands for reservations, annuity payments and other government promises. The Ojibway unsuccessfully demanded compensation for resources such as timber, which they contended had not been surrendered under treaty. We were told by Leo Waisberg that the Ojibway also thought they would receive improved agricultural land but reserve boundaries were not set aside until some years later and this promise never materialized (trans: vol. 313, pp. 55461-2).

In the mid-1800s, the Ojibway sold or traded cord wood to road contractors and steam barges operating on the Dawson Road. Large scale logging began in the GCT #3 area after the 1873 treaty and Ojibway were employed cutting timber for large companies into the early 1900's. The witnesses told us that Indian employment in logging declined partly because of ethnic bias by the forest industry: "In many cases the Ojibway were not seen as the best employees that could be obtained. They usually wanted good wages and the cultural difference posed some problems. As well, some people just didn't want any Indians working for them" (trans: vol. 313, p. 55383).

Denied employment off-reserve, the Ojibway turned to cutting timber on their reserves. We consider the history of on-reserve timber resources later in this chapter.

Pressure to force the Ojibway to stay on their small reserves also came from restrictions on their use of off-reserve game and fish beginning in 1915 and we discuss this below. The witnesses concluded their description of the historical circumstances that led to the confinement of Indian bands to reserves with the observation that by the early 1900's the "Ojibway were no longer participants in the general economy of the region and had suffered grievous damage" (trans: vol. 313, p. 55412).

The Ontario Metis and Aboriginal Association

The history of the Metis is different from the experience of First Nations on reserves, but what they told us of being excluded from the benefits of Timber Management is the view shared by other Aboriginal communities.

Descendants of marriages beginning in the fur trade era between Aboriginal women and white men are known as Metis and their communities were usually found on the peripheries of or loosely aligned to Indian bands (Exhibit 1914, p. 2).

The status of Metis people was affected by government policy. Under the *Indian Act*, the Indian agent decided if a mixed-blood individual or family was to be classified as "Indian." If so declared, the Metis could live on the reserve and be recognized as a Treaty Indian for exercising treaty, food and harvesting rights. Indians and Metis not designated as being Indian were given no title to lands or resources. Thousands of today's off-reserve Aboriginal people are descendants of Indians who, upon receiving Canadian citizenship, were stripped of status under the *Indian Act* and forced to leave the reserve communities (Ex. 1914, p. 3). As a result of this policy, many Metis and Indians live off-reserve and identify as communities but have no land base.

OMAA was formed in 1971 to represent the interests of what are today about 120 local associations of Metis and non-status Indians living off-reserve and, with the 1985 changes to the *Indian Act*, about 20% of OMAA's members are now registered as status Indians. Marge Misek, an expert planning witness called by OMAA, presented us with the results of her research on the demographic and socio-economic characteristics of the OMAA constituents. She estimated the size of the off-reserve Aboriginal population living in Ontario in 1986 to be between 169,600 to 198,400. (Ex. 1914, Report 1, p. 29). OMAA complained to us that while their peoples' Aboriginal and treaty rights are entrenched in the Constitution, the Federal and Ontario governments continue to ignore these rights, resulting in the assimilation and impoverishment of their communities.

TREATIES AND ABORIGINAL RIGHTS

None of the parties to the hearing, with the exception of OMAA, suggested that the Board could or should interpret treaties, Aboriginal rights or land claims. Aboriginal intervenors argued that their treaty and Aboriginal rights to some of the timber resource are constitutionally entrenched and exist as an obligation of the Crown which is inherent as well as owed through treaty, affirmed by section 35 of *The Constitution Act* and upheld by the Courts. As such, they argued we must recognize these rights in our decision by denying approval unless these rights are recognized and accommodated. At the same time, GCT#3 said that the Board was not being asked to determine what these rights are but only to provide "... a framework within which the relevant parties can make them on a constructive and reasonable basis" (GCT #3 Final Argument, para. 129). Mr. Donald Colborne, counsel for GCT #3, told us that his clients intend to advance the recognition of their rights in negotiations and before the Courts and they believe that if the Board accepted their proposal our decision could assist these efforts.

MNR submitted that these matters are being negotiated in different forums and gave us examples in 1992 of contemplated negotiations with GCT #3 (Board Interrogatory 81), negotiations with NAN on matters of self-government initiatives (Board Interrogatory 81), discussion with the Union of Ontario Indians that may lead to a framework for Aboriginal fishing negotiations (Board Interrogatory 82) and funding to OMAA to deal with issues such as self-government and community identification (trans: vol. 326. pp. 57596-99; Ex. 1924).

We listened to evidence on treaties and aboriginal rights to give us the historical context for the situation of First Nations and Aboriginal communities today, to understand how Aboriginal peoples' access to forest resources is governed and to understand how timber management could affect their interests. This evidence was provided by witnesses for GCT

#3 (trans: vols. 312, 313 and 318), for OMAA (trans: vol. 325), for NAN (trans: vol. 330), for Northwatch (trans: vol. 371) and for MNR (trans: vols. 43-51). We also heard comments about treaties and Aboriginal rights from many individual Aboriginal people during their submissions on various aspects of their experience with and concerns about timber management planning.

The treaty process began with the Royal Proclamation of 1763, following the British Conquest which set out an Indian Policy concerning trade and travel. Mel Crystal, MNR's Co-ordinator of Native Issues in Corporate Policy and Planning, described for us what he considers to be important aspects of the Royal Proclamation, although his interpretation was disputed by witnesses for the First Nations and Aboriginal peoples. Mr. Crystal said all of the land within the new territory which was unceded or unpurchased from the Indians as of 1763 was reserved to the Indians as their hunting grounds, but in his opinion it was not the intention of the British Government of the day that it would be reserved to those people for ever and ever. (trans: vol. 44, p. 7468). The Proclamation established the treaty process with the provision that the Indians could only surrender land to the Crown at an open meeting designed for that purpose and involving representatives of the Crown and the Indian people.

We heard extensive evidence from GCT #3 that the Ojibway never intended with the signing of Treaty #3 to surrender their rights to fishing, hunting, and trapping and other aspects of their traditional way of life (trans: vol. 312, Ex. 1849A). GCT # 3 is negotiating a land claim on the Treaty #3 territory, encompassing 130,000 square kilometres (55,000 square miles) of Northwestern Ontario (trans: vol. 315, pp. 55646-47). The evidence of Brad Morse on the evolution of Aboriginal rights through the courts and the Constitution demonstrate that Aboriginal people across Canada have felt historically and continue to believe today that their treaty rights have been unfairly and unsatisfactorily defined and mostly denied by the federal and provincial governments (trans: vol. 325).

The written evidence of elders and leaders of NAN/Windigo concerning treaty and resource development was that they never understood that by signing the treaty they would lose their sovereignty or access to lands and resources.

Dr. Peter Poole testified for GCT #3 that the debate over recognition of aboriginal land rights is occurring in many countries. In his view the recognition of aboriginal rights is a pre-condition to the participation of native peoples in forestry. He identified what he sees as an emerging international trend towards social or community forestry. "It aims at sustainable practices in which ecological diversity is matched by economic diversification and which maximize the involvement and returns to forest communities" (Ex. 1879, p. 9).

Mr. Crystal told us that contained within the treaties is a mechanism which gives resources to the Crown in a general sense with the words "said Indians hereby cede, release, surrender and yield ... all their rights, titles and privileges whatsoever to the lands." Mr. Crystal concedes that the true effect of these words in law is subject to debate. (trans: vol. 44, p. 7482) In final argument, MNR concludes: "The parameters of Treaty and Aboriginal Rights, both in a legal context and otherwise remain to a large extent undefined. Consequently it is not possible to define and assess the potential effects of Timber Management activities on Aboriginal and Treaty Rights" (p. 452 of MNR Argument).

It was MNR's evidence that the major treaties in the area of the undertaking are: the Robinson Treaties, signed in 1850; Treaty No. 3, signed in 1873; Treaty No. 5 adhesions, signed in 1908-1910; and Treaty No. 9, signed in 1905 and 1906, with adhesions in 1929 and 1930. Copies of the text of these treaties were provided by MNR in its Panel 6 witness statement (Ex. 209, pp. 188-265) and the areas are shown on a map (Ex. 209, p. 272).

Mr. Crystal told us that the constituency of the Nishnawbe-Aski Nation is those people entitled to benefits under Treaties No. 9 and 5. The constituency of Grand Council Treaty No. 3 is those people entitled to benefits under Treaty No. 3. Other organizations such as those represented by Northwatch include members who are affected by various treaties (Ex. 209, pp. 167-168).

Mr. Crystal explained to us that the literal interpretation of the language of Treaties 3, 5 and 9 establishes that Indians are entitled to hunt, trap and fish on non-reserve treaty lands except where these lands are "taken up from time to time for settlement, mining, lumbering, trading or other purposes." (pp. 169-170 of Ex. 209). This interpretation is recognized in the Ontario government's leniency policy allowing Indians to use off-reserve forest resources for their subsistence needs. (This policy is discussed on p. 357.) Mr. Crystal also told us in his view that the treaties do not contemplate compensation for Indians for loss of their right to pursue these vocations when they are displaced. (trans: vol. 44, p. 7505).

We believe that if treaties were honoured and fulfilled, Aboriginal peoples could have the land and resources necessary to support their governments. Sharing of resource rents through royalties and an expanded land base could be the basis for economic self-sufficiency. The timber management process by itself will do relatively little to overcome the problems facing the First Nations and Aboriginal communities in the area of the undertaking, however some opportunities do exist in it.

GOVERNMENT INVOLVEMENT IN NATIVE COMMUNITIES' USE OF FOREST RESOURCES

We wanted to understand the attitudes and actions of the Federal and Ontario governments that contributed to the isolation of Aboriginal peoples on reserves and their exclusion from the forest based economy of Northern Ontario.

As a starting point, the small reserves to which Aboriginal native peoples were eventually confined preclude on-reserve forestry as an economic activity that can support these communities. For example, the GCT #3 total reserve area is only 120,955 hectares (385,211 acres), classified into 62 separate reserves with an average area of just under 2,000 hectares (Ex. 1859, pp. 7-8). GCT #3 witnesses estimated that the entire productive forest area for all GCT #3 reserve lands is about 93,000 hectares, but that less than half of that land could be managed for timber production (Ex. 1959, pp. 11-12). The NAN/Windigo reserve lands total about 320,000 hectares (800,000 acres), split into 50 reserves with an average area of 6,400 hectares (NAN Witness Statement 1, pp. 19-21).

Federal Government

Again we found the evidence of ethnohistorians Tim Holzkamm and Leo Waisberg to be helpful in explaining to us what happened to the reserve timber resources with the example of GCT #3 communities. (GCT #3 Witness Panel 1, vols. 312 and 313). These witnesses attribute the depletion of on reserve timber to mismanagement by the Department of Indian Affairs.

With the decline of Aboriginal employment in the off-reserve lumber industry after 1900, Ojibway cutters had to rely on their reserve timber. The witnesses told us that the Department of Indian Affairs gave Ojibways permits to cut only the dead and downed timber for income in lieu of government assistance. The Ojibways complained that the more valuable green or living timber was sold to large lumber companies at auction by the Department of Indian Affairs. The money from these timber sales was placed in trust funds and administered by the Department but the Ojibway were suspicious and complained frequently that this revenue was not dispersed to them. The witnesses told us that the Ojibway were "pressured" to surrender their reserve timber to the Department rather than cut it themselves for reasons including promise of employment, which did not always occur, and the threat of losing the timber to fire or trespass.

The Department of Indian Affairs did not begin doing formal surveys of the timber resource on each reserve until the 1920's but trespass and the theft of reserve timber had been under way since 1880 with the construction of the Canadian Pacific Railway. The witnesses testified that the most valuable pine stands in many reserves were cut during this period. Despite heavy penalties for timber trespass under the *Indian Act*, the Department rarely prosecuted or enforced them and the Ojibways also complained of improper scaling. The witnesses concluded that many of the bands suffered significant losses in revenue as a result.

Despite heavy logging on reserves there are few records of any regeneration efforts (trans: vol. 315, pp. 55627, 55638). Natural regeneration has not been successful. Little money was available for artificial regeneration and the Ojibways had little confidence in it. Due to the policy of the Department of Indian Affairs, reserve forests were damaged when the good timber was sold to white contractors. A study by the Department of Indian Affairs in 1983 indicated that forest inventories conducted between 1947 to 1960 showed most of the good wood had been cut and thus major forest rehabilitation was needed. It didn't occur. Without wood resources to provide opportunities for jobs and income, how can the poverty of Aboriginal communities be eliminated?

We were told that stumpage fees for cutting on-reserve timber were not paid directly to the Ojibway but instead held in trust for them by the Indian Affairs Department. Witnesses described for us their concerns that there was too little accountability of these funds and many problems in having this money released to the bands (trans: vol. 315, pp. 55632-33).

The history of the Ojibway shows that the federal government made the problem worse. In addition to depriving the Ojibway of timber resources, the federal government did little to protect them against the loss of commercial fishing, against flooding of their lands by construction of dams and against loss of their agricultural lands in the late 1800s as we described earlier.

The situation was worsened yet again by the federal government. When the Ojibway began to organize politically they were prohibited by the *Indian Act* from hiring lawyers. Mr. Waisberg told us:

For example, after Indians in southern Ontario began to press for their treaty rights as they understood them in the mid-1920s, the 1927 *Indian Act* came up with a new section that prohibited the collection of money to further or advance Indian claims, which was written in such a way as to have the effect of prohibiting Indians from hiring lawyers.

There was a lawyer in Kenora called Robinson who began to draft some of these petitions for these newly forming Indian councils and he received the standard sort of letter from Indian Affairs pointing out this section of the *Indian Act*.

(trans: vol. 313, p. 55419)

GCT #3 remains critical today of the administration of its reserve forests under the *Indian Act*. It submits that insufficient effort is being made to regenerate reserve forests that were stripped of their merchantable timber through past mismanagement. It described logging on reserves today as "rare" with only a few communities owning equipment or operating sawmills and few with the management skills to operate successfully in off-reserve logging. On-reserve forestry now consists mostly of management of immature stands and rehabilitation of previously logged areas.

GCT #3 acknowledges, however, that the situation has improved since 1985 with the creation of the Indian Forestry Development Program (IFDP) funded by the Department of Indian Affairs and with involvement by the MNR. GCT #3 sees the work of the IFDP, whose board of directors consists of representatives of three tribal areas, as the first serious attempt at forest management on their reserves. By 1990, with funding from Forestry Canada, over 1050 hectares of reserve lands were planted and tended, 10 management plans prepared and almost 50 person-years of employment for community members has added \$1.25 million to the reserve economies. There has been nothing for First Nations and Aboriginal peoples similar to the Forest Management Agreements with forest industry companies.

We heard submissions from Chief Willie Wilson, chairman of the IFDP, Ron Simmons, the manager of IFDP, and a number of past and present directors including Roy Carpenter, Francis Kavanough, Donald Jones, Rocky Seymore and Paul Watts (trans: vols. 314 to 316). The IFDP identified the following major forest issues:

- (1) Access to off-reserve forest resources is very restricted and First Nations require assistance in obtaining access if long-term economic development in the forestry sector is to be successful.
- (2) The Indian timber regulations, which apply only on Indian reserves, have not been successful in providing adequate forest management guidance to reserve forest lands and need to be revised to reflect proper forest management direction and Band philosophies and needs.

- (3) There is a need for long-term forest management planning and operations on reserve forest lands in order to raise the capability of those lands to acceptable economic levels.
- (4) There is a lack of qualified Indian forestry professionals and forestry-related training for Aboriginal people.
- (5) First Nations require assistance in the identification and development of viable commercial opportunities in the forestry sector.
- (6) Any forestry program operating on behalf of the Treaty #3 First Nations must be managed and directed by those First Nations.

The National Aboriginal Forest Association was created in 1989 with the overall goal of promoting and supporting increased aboriginal involvement in forest management and related commercial opportunities (Exhibit 1857).

Ontario Government

The ethnohistorian witnesses for GCT #3 described for us how the attitudes and actions of the Government of Ontario contributed to the impoverishment of the Ojibway by denying them off-reserve access to hunting, fishing and trapping.

We were told that the Ontario Government began restricting game and fish for Indians in 1915 and in 1933 passed regulations formalizing this policy. In 1938, the Kenora Indian agent observed the effects of these restrictions that took:

... away all the rights and privileges the Indians thought they had, under the meaning of the treaty. I don't know what could be done now, but it certainly seems to me that we should take some action, as every Indian has to break the regulations to enable him to get food to exist. Fishing and hunting is the most pressing of our problems, and something should be done immediately. The Chief and one of the counsellors from Islington Band were in to see me yesterday and said the Indians would be starving by Christmas as there was very little fur, and white man trapping in their territory, and legally they could not get fish or meat for food for themselves or their families ... previously I used to tell them to grow potatoes, put up fish and meat, now if I tell them to do this, I am conniving in the breaking of the regulations, and presumably might be held liable myself.

(Ex. 1853)

We asked the witnesses how governments expected Aboriginals to make a living when they were confined to small reserve lands and denied access to off reserve forest resources. The witnesses gave us the notes of the same Indian agent in 1939 who observed:

Mr. Taylor, deputy minister of Ontario Game and Fisheries when talking to me last summer, said it was nothing to do with him, when asked how the Indians were going to make a living. It was our department's baby, not his and the Indians were not going to live on the province's moose, deer, fish, etc. and some other way of their making a living should be devised by us.

(Ex. 1853)

By 1979 the government of Ontario had instituted a formal guideline (Ex. 227) establishing an increased awareness of and commitment to the fulfilment of the treaty rights of Aboriginal peoples. The resultant "leniency policy" was implemented by MNR in order to ease the restrictions on status Indians to harvest game and fish for non-commercial use on non-reserve treaty lands. This was to be accomplished through lenient enforcement by MNR of otherwise applicable legislation and regulation. In recognition of an important court decision dealing with Aboriginal rights (Sparrow v. R., [1990] 1 S.C.R. 1075), this policy guideline was reformulated on May 7, 1991, as an "Interim Enforcement Policy" (Ex. 1895). This means the leniency policy was changed from an indulgence by the province to one specifying the extent of Aboriginal rights to harvest certain resources.

We heard testimony from elders for NAN and the Windigo Tribal Council who told us that even with the leniency policy, they believe that MNR Conservation Officers treat Aboriginals unfairly and prosecute them more vigorously than non-natives. Mrs. Loon told us that conservation officers "trick Indian people" in order to catch them offending fish and game regulations and she gave us an example where she believes that MNR allows American hunters and anglers to use freely what Aboriginals consider to be their territory (trans: vol. 330, p. 58078-80). We heard similar testimony from Arthur Elliott, an OMAA witness (trans: vol. 364, pp. 63429-47) and Norman Aguonia, a Northwatch witness from Manitoulin Island (trans: vol. 368, pp. 64031-32).

MNR told us that it recognizes the very high rates of unemployment and limited opportunities for developing a stable economic base in many Aboriginal communities. Although their witnesses gave us examples of MNR's attempts to encourage Aboriginal involvement in timber management operations, the results are not likely to be impressive without access to timber and creative thinking. The evidence of the intervenors, particularly GCT #3 (Ex. 1867 and Ex. 1879) and OMAA (Ex. 2164), is that attempts by MNR to give native communities access to the benefits of timber management operations have

encountered obstacles such as the fact that the merchantable timber near reserves is already allocated to large licensees, there exists an insufficient quality or quantity of timber on or off reserve to support existing operations, there are difficulties in getting access to wood through the current allocation system and employment in tree planting and fire fighting is declining.

NAN described for us their contemporary interest in forestry issues (NAN Witness Statement #1) beginning with the 1974 announcement that the province of Ontario had agreed to give Reed Limited, a forest products company, the right to harvest 49,200 square kilometres of uncut forest in NAN territory and to build a pulp and saw mill complex in the Red Lake-Ear Falls Area. In 1972 feasibility studies and preliminary work had begun on the polar gas pipe line project and its corridor ran adjacent to four NAN communities. In 1972, the Ontario government decided to develop lignite deposits in the James Bay lowlands and in 1978 MNR signed a 21-year lease with Onakawana Development Limited to establish a coal mine site near three NAN communities. NAN was concerned that these developments would threaten their way of life and erode their treaty and Aboriginal rights.

In 1977, the Ontario Government established the Royal Commission on the Northern Environment, chaired initially by Justice Patrick Hartt and then by Edward Fahlgren, to inquire into the environmental effects of major development north of the 50th parallel. NAN participated in the work of the Commission, which released its final report in 1985. We understand that few if any of the Commission's recommendations have been implemented by successive Ontario governments. Mr. Fahlgren appeared before us and gave us his views on the need for Aboriginal peoples to be involved in the planning process in order to protect their values and to avoid the destruction of their communities as resulted from resource development in the past (trans: vol. 309, p. 54943).

THE PRESENT

We were convinced by the evidence on the contemporary social and economic conditions of First Nations and Aboriginal communities that they face particular problems different from those of other northern Ontario residents. The consequences of their exclusion from the economy of northern Ontario and their hopes and expectations from timber management planning are discussed below.

George McKibbin, an environmental and land use planner, in conjunction with Aboriginal researchers, prepared profiles of four Windigo Tribal Council communities. He described the grim socio-economic conditions of Slate Falls, Osnaburgh, Cat Lake and Saugeen First

Nations. None of these communities has adequate water supply, sewage systems or electricity. For most residents, water is hauled from a lake and boiled before use. Most homes have outdoor privies. Most households use wood for cooking and heating. In contrast, facilities such as provincially and federally run schools and health centres, located in these communities, have water, sewage and electricity. The communities have few or no roads and only one is accessible by car. Children from the Saugeen First Nation must go to Sioux Lookout or Thunder Bay for high school and the present drop-out rate is 100%. Mr. McKibbin also described the limited employment opportunities of these First Nations, and stated that many community members still practise traditional activities such as fishing, hunting, trapping and harvesting of wild rice.

Margaret Misek provided us with a socio-economic picture (Ex. 1914 and Ex. 1921) of the OMAA off-reserve population based on Canada's census data, which are recognized as problematic because of low participation rates by Aboriginal communities among other reasons (trans: vol. 326, pp. 57509, 57536) and a 1985 survey commissioned by OMAA. Ms. Misek's overall conclusion is that the off-reserve OMAA population has a slightly better socio-economic status than on reserve Aboriginals by such measures as education levels and employment.

GCT #3 witnesses Paul Banerjee and Miriam Pare, economists with the Department of Indian and Northern Affairs, prepared an economic analysis (Ex. 1883) of the forest industry in the Treaty #3 area of northwestern Ontario. While we recognize the limitations of their analysis due to a scarcity of data and their reliance on 1986 census data, we find their evidence to be helpful in our understanding of the obstacles confronting GCT #3 communities in participating in the benefits from the forest industry.

The witnesses concluded that Aboriginals are at the bottom end of the occupation structure in the forestry sector and the employment rate and the average employment income are both considerably less for status Indians than for other Canadians. For example, the average annual wage of status Indians was \$9,900 compared to \$15,500 for other Canadians. Transfer payments received by status Indians in the Treaty #3 area average \$3,881 annually compared to \$3,890 annually received by other Canadians; this statistic challenges the perception that Indians receive more government spending than non-natives.

Only a fraction of the overall economic and social returns from timber harvested on reserve lands accrues to the First Nations people. Almost no Aboriginal involvement occurs in the manufacturing side of the forest industry. Only a small number of Aboriginals own logging and silvicultural businesses and other businesses to take advantage of the economic spin-off from forestry. Part of the logging on reserves is still done by outside operators and there

was shortage of trained Aboriginal workers. The witnesses estimated that the economic benefits of the wood cut (i.e., 40,420 cubic metres) in 1986 on Treaty #3 reserves at \$5.8 million. The witnesses arrived at this figure by applying the estimated provincial value added generated per cubic metre of wood cut through to its manufactured end-product.

GCT #3 status Indians accounted for 6.8% of the working age population but their employment share in the forestry sector was only 3.3%. The witnesses told us that the employment problems will worsen in the future because by the year 2000 approximately 25% of new labour force entrants in the Treaty #3 area of northwestern Ontario will be status Indians. The Indian population is expected to grow almost two times faster than the total population in Canada in the next two decades and is aging less rapidly.

The witnesses concluded that in order to improve the economic conditions of Aboriginal people living in rural or remote reserves there is a "clear need for higher resource-based developments, greater access to off-reserve businesses and marked increases in participation in the mainstream economy" (Ex. 1883, p. 14). The witnesses estimated that 81% of Treaty #3 forest land on reserves are young or immature forests resulting from past logging activities, inadequate forest management practices and funding and the effects of forest fires.

TIMBER MANAGEMENT PLANNING

Mistrust of the Timber Class EA Process

Native communities were not even mentioned or identified as stakeholders with an interest in timber management planning in earlier drafts of the Class EA document (trans: vol. 46, p. 7871). When the Environmental Assessment Branch of the Ministry of the Environment prepared the government review of the Class EA, responses were solicited from provincial and government agencies. It is hard to believe that the Ontario Native Affairs Directorate offered no specific comments or concerns about the Class EA when it was originally circulated (Ex. 5, p. 77).

However, it should be added the Board saw evidence where individuals within MNR were genuinely concerned and made tremendous efforts to assist bands to develop economic activities which could be beneficial (trans: vol. 58, p. 9989 and trans: vol. 50, p. 8567).

NAN brought to our attention the fact when the MNR introduced the Class EA for review in 1985, the Area of the Undertaking included forest management units in NAN territory north to the 52nd parallel. When MNR amended the class EA in 1987, it excluded the area

between the present Area of the Undertaking and the 52nd parallel. NAN was concerned that MNR might later seek to extend the terms and conditions of the class EA to those lands. This issue was resolved when the MNR satisfied NAN with an agreement that it would cooperate in developing a proposed exemption order for certain timber management activities in the area north of the 50th parallel (Ex. 1956).

Timber Licences

As discussed earlier, the GCT #3 reserves, for example, contain small amounts of merchantable timber and regeneration on reserves, following mostly non-native harvesting, has been inadequate. Consequently, allocation of off-reserve cutting licences is of paramount importance to these communities. MNR presented examples of providing district cutting licences and allowable cuts to Aboriginals (trans: vol. 316, p. 55809). We received many complaints that the licences were either too small or for areas where the best timber had already been removed, leaving the most difficult areas to be harvested by the Aboriginals. GCT #3 witnesses described their existing district cutting licences (DCL) as being too small to support employment or income for their communities: Eagle Lake with a quota of 5,500 cords annually; Grassy Narrows with a quota of 3,000 cords annually; and Wabigoon with the quota of 1,500 cords annually. The witnesses described frustration with the size of their quotas, which are divided among many individuals, as compared with large quotas allocated to one non-native contractor. For example, 30 loggers on the Eagle Lake reserve are required to share 5,500 cords but one contractor in Dryden has a 15,000 cord quota (trans: vol. 316, p. 56262). Wabigoon has a DCL of 1,500 cords to support a workforce of 32, compared with a non-native contractor nearby with 15,000 cords to himself (trans: vol. 316, p. 55527). Comparisons were frequently presented to us where the Aboriginals received a small cutting licence of 1,500 to over 5,000 cords for a Band for 30 or more cutters while one non-native contractor had a 15,000 cord DCL.

Waiting for a licence to become available is a long and frustrating process. Over a 10-year period, Roy Carpenter moved from 27th to 19th place on the waiting list. Other witnesses, including the Seine River Band, the Rainy River Band and the Sagamok Anishinabek, described similar difficulties in obtaining cutting licences.

It will not be easy for MNR to resolve the cutting licence issue. The reality is that most of the Area of the Undertaking is fully licensed to non-Indians. The MNR has two choices. It could remove existing licences from the present holders, which would create social and economic problems in the white community with attendant political unrest and hostility. MNR submitted that if changes to existing licensing obligations were required,

"consideration of such things as restitution and alternate employment mechanisms would likely be required" (Response to Board Interrogatory 85). Or MNR could give preferential treatment to Aboriginal applicants when licences become available for re-assignment. This action would also likely meet with resistance from the non-native community. Nonetheless, we strongly believe that off-reserve timber must be made available for harvesting to the Aboriginal communities, or they cannot begin to improve their economic situation. We discuss the licensing issue below.

Employment

Employment opportunities are limited and unemployment rates are high for most reserve populations. Witnesses for GCT #3 gave unemployment figures of 80% in the winter and 50% in the summer for Big Grassy, 40% for Couchiching, 70-75% for Lac Seul, 60-70% for Onigaming and 78% for Wabigoon. The Rainy River community, with 13% unemployment, was the only one reporting a comparatively low unemployment figure. High unemployment with few economic development opportunities was described as a major problem for all of the remaining GCT #3 communities. The employment outlook was equally bleak for the NAN communities.

We received only very little evidence that companies in northern Ontario have in the past and continue to employ significant numbers of Aboriginal people in their operations. We found three exceptions: 50% of the employees of the Lecours Lumber Mill in Calstock are Aboriginals, Eddie Forest employs 70-80 Aboriginals in its woods operation and MacKenzie Forest Products sawmill in Hudson employs 17 Aboriginals. Overall, however, job opportunities are too few due to historical forestry practices on reserves and the insufficient number of cutting licences available to Aboriginal communities. Also we were told that racism continues to be a problem experienced by native peoples who seek off-reserve employment and is another obstacle to their participation in the general economy.

MNR has trained Aboriginals to be firefighters for a number of years but their ability to be employed during the summer fire season depends on the occurrence and location of forest fires.

MNR has also employed Aboriginal peoples in manual tending operations. Tree planting was a source of employment for these communities but it has declined significantly since MNR started contracting out this work to private tree planting contractors, resulting in the replacement of both Aboriginal and non-Aboriginal northern youths by students hired from southern Ontario. Even though the tree planting season is only a few weeks duration, the

income can be particularly significant to native communities. We were persuaded by the submissions we received, (see p. 223 of Chapter 6) that northern residents, particularly native people and students, should be given the opportunity for employment in tree planting. In Condition 75 we order MNR to require tree planting businesses to advertise and offer jobs in local northern communities before hiring students exclusively from southern Ontario. But we recognize that such part-time, seasonal employment is not enough to improve the quality of life for First Nations and Aboriginal peoples.

At the hearing, MNR reported that it employed only 75 permanent staff who identified themselves as having a native background as of September 1991. Reliable statistics are not available on the number of unclassified staff who identified themselves as native persons employed by MNR. These employment statistics come from a workforce profile survey whose purpose is to monitor long term trends and the representation of designated groups, including native and aboriginal peoples under employment equity legislation. The survey relies on voluntary self-identification of background. MNR said the Human Rights Code and *Freedom of Information Act* limit its ability to provide definitive information on the numbers of natives employed within the ministry (Response to Board Interrogatory 83).

The alternatives to employment in forestry are the traditional activities engaged in by Aboriginal communities. Wild rice harvesting and trapping can provide some income, the amount although small is also very important to native communities. Wild rice is essentially available for commercial use by status Indians only but markets for wild rice are not booming. Aboriginal communities have also faced a decline in income in recent years from trapping due to falling prices and the anti-fur lobby, among other factors. Some witnesses also claimed that wildlife is disappearing from their traplines.

Many Aboriginals exist on welfare and fish is an important food supplement to their diet. Witnesses from the communities stated that fishing stocks have declined due to mismanagement or have been seriously affected by over-fishing, dam construction or pollution from paper mill effluent. For example, mercury poisoning in the 1970s of the Wabigoon/English River systems downstream from the Dryden pulp mill, destroyed the fishing and tourism economies of the Grassy Narrows and Islington/White Dog communities (Ex. 1867, p. 8, 11). Game animals are another important aspect of the diet of native communities and witnesses reported to us that they have observed a reduction in game animals for hunting.

Many other obstacles standing in the way of fuller participation by Aboriginal people in the forest industry were identified at the hearing. Among these are lack of training and education and lack of access to capital to purchase the extremely expensive logging

equipment such as skidders, to compete for contracts and to pay workers' compensation premiums in advance. We also received a complaint that the cost of union dues could exclude Aboriginal peoples from logging activities.

We recognize that there are cultural factors outside of timber management planning that may preclude Aboriginal peoples from taking advantage of forestry employment. For example, we heard from native people that they dislike regulations concerning safety training and protection equipment that are required for logging operations and union management contracts that apply to much of the harvesting activity. Archie Potson with GCT #3 identified the safety and training certificate required by the Ministry of Labour for loggers as obstacles to Indian involvement in logging. Barney Petiquan, Chief of the Wabauskang First Nation, claimed that his people do not have jobs in off-reserve forestry because they do not want to live year - round in the mill town, which interferes with their fishing and hunting activities. Usually, Aboriginal cultural needs are not accommodated. The lack of transportation to mill towns or to logging sites poses another problem for commuting off-reserve. Our concern is solely that Aboriginal communities be given access to the same opportunities that are available from timber management operations to other northern Ontario residents.

Effects on Native Values and Activities

MNR took the position that Aboriginal communities can be specifically affected by timber management operations and that because of their history and culture, Aboriginal people, especially those living in remote areas, have particular concerns. We heard considerable evidence from Aboriginal people describing for us their way of life and the values that need protection from the effects of timber management.

Chief Steve Jourdain described how hunting and trapping are considered to be traditional, spiritual experiences for Aboriginal people (trans: vol. 321, pp. 56571-74). Elders who were witnesses for NAN described their lives spent in the bush hunting, trapping and fishing.

Mr. David Loon explained the importance of traditional activities by saying:

Hunting is very important to me. My grandfather said that no matter what happens to you, don't give up hunting as you grow up. Each year, I set aside a certain time for hunting because I was raised this way and don't want to lose this ability. I have a family and I am trying to teach my children the traditional ways as my grandfather taught me. I am passing on as much as I can.

Aboriginal peoples, therefore, are concerned that timber operations could limit their ability to engage in traditional use of resources by causing the loss of habitat or reduction of wildlife species, which are concerns shared by non-native anglers, hunters and trappers. The Timber Management Guidelines for protection of fish habitat and moose habitat and other implementation manuals are means of preventing or mitigating the negative effects of timber management on hunting, fishing and trapping.

Mr. Wakegijig, of Wikwemikong First Nation on Manitoulin Island, a witness for Northwatch, expressed concern about the protection of medicinal plants such as prince's pine, pennyroyal, birch bark and senec root, highly valued by Aboriginals and found at locations on and off reserves (Ex. 2179, Tab 8).

Other forest resources identified by Aboriginals as being important values and requiring protection include wild rice, fuel wood and berry picking sites. MNR submitted that these values can be protected through the Area of Concern process. This is the procedure planners use to make sure the timber harvest does not damage an identified non-timber value. The process is explained in Chapter 3, p. 91. It is essential that good communication exists between the planning team and the affected communities if these values are to be identified and protected.

Sites of religious and cultural significance for native people include traditional pow-wow sites, spirit rocks, burial grounds, pictograph sites, traditional camping areas and other archaeological sites. Aboriginal witnesses gave us examples of where such sites had been damaged in the past and they see the need for information on the location of some of these sites to remain confidential. MNR witnesses testified that they take specific actions to protect these sites, including termination of field operations on suspected sites pending investigations by the Ministry of Culture and Communications and using reserves or modified operations such as restricting or delaying harvest to avoid site disturbance or to permit excavation or removal of artifacts (Ex. 416B). MNR in cooperation with the Ministry of Culture and Communications and a committee of experts developed the Timber Management Guidelines for the Protection of Cultural Heritage values, which were approved in 1991 and are now being used by MNR staff in the field (Response to Board Interrogatory 30). MNR also reported on a methodology for predicting the existence of potential cultural sites under development at Lakehead University (trans: vol. 390, p. 67185).

The construction of roads for timber management operations affects the remoteness of communities in which many Aboriginal people live. MNR gave us examples of where loss of remoteness can be positive or negative depending on the individual community's objectives (trans: vol. 316, p. 55916 trans: vol. 317, pp. 55977, 56035 and 56052-60). It is

clear for this and many other reasons that these communities must be involved early on in the timber management planning process.

Co-Management Models

We heard evidence on the concept of Aboriginal communities co-managing timber resources with the MNR, suggesting a more active role in timber management planning than one of consultation or advice. Mary Laronde of the Teme-Augama Anishnabai First Nation on Bear Island told us that they signed a memorandum of understanding with Ontario in April, 1990 (Ex. 2168, Tab 7). This agreement set out a bilateral process which she called "co-management" over the area on which the First Nation has land claims. The bilateral process agreed to involves the Teme-Augama Anishnabai examining and consulting with the MNR on Crown Management Unit plans in the Teme-Augama Anishnabai Homeland; the Teme-Augama Anishnabai making recommendations as to how the plans should be modified; and the MNR undertaking to modify the plans where feasible. The memorandum of understanding also states that no timber licences will be issued without the approval of the Stewardship Council, which will be created with equal representation of members appointed by the Teme-Augama Anishnabai and by Ontario. Tom Whitfield, a forestry consultant for the Teme-Augama Anishnabai, said that the problem with current co-management is a conflict between management philosophies (trans: vol. 366, p. 63760). He said that MNR has so far allowed the Teme-Augama Anishnabai very little input in the bilateral co-management arrangement. Ms. Catherine Blastorah, counsel for MNR, pointed out in cross-examination of Mr. Whitfield that representatives of the Teme-Augama Anishnabai are involved in a major amendment under way in relation to the Temagami Crown M.U. as members of the planning team.

Paul Banerjee, a witness for GCT #3 (Panel 5), described the Stuart Trembleur Lake Band/Tanizul Timber Land in British Columbia as a co-management success story because Indians have been managing forest lands, providing job training and employment for their members and using good management practices for a viable operation. About 98% of this Band's forest land is owned by the Crown and not the reserve. The community obtained a 48,000-hectare tree farm licence through competitive bidding in 1982 and they are complying with the government's forest management standards. According to Mr. Banerjee, the company's forestry operations generate \$3.5 million in gross sales annually and the direct and indirect benefits to the native communities are estimated to be \$23 million yearly.

INTERVENORS' PROPOSALS

Each of the four major Aboriginal intervenors had a different solution to addressing the particular interests and concerns of their separate communities.

Nishnawbe-Aski Nation and the Windigo Tribal Council (NAN/WTC)

The ruling NAN/WTC asks the Board to make is contained in an agreement negotiated by NAN/WTC, the MNR and the OFIA and presented to us by their counsel, Mr. David Hunter, at the Sioux Lookout hearing on September 15, 1991 (Ex. 1957). The parties worked diligently to resolve their differences and their agreement helped us expedite that portion of the hearing.

The agreement described a process for giving the Aboriginal communities the opportunity to be part of the timber management planning process, for making sure that the special social and cultural concerns of these communities are considered in timber management planning and that timber management planning is a workable process for First Nations, the forest industry and the MNR. The principles in this agreement formed the basis of MNR's proposed timber management native consultation program, which we are ordering as a Condition of Approval discussed in our findings below (see p. 371).

NAN/WTC chose to pursue the issue of its communities' access to the economic benefits of timber management planning, or the "allocation" issue as we called it at the hearing, through separate negotiations with MNR. NAN was satisfied with their correspondence in 1991 with the Minister of Natural Resources as a commitment to engage in negotiations on allocations and, therefore, this matter was not pursued by NAN/WTC at the hearing (Ex. 1956). It can be seen from the correspondence that the negotiations contemplate timber allocation issues on a community-by-community basis and adequate wood allocations for domestic and commercial use.

One of the approaches taken by NAN/Windigo to access the economic benefits of resource development are two agreements concerning goldmine projects, negotiated with Dome Exploration (Canada) Ltd. in 1987, referred to as the Dona Lake Agreement (Ex. 370) and with St. Joe Canada Inc. in 1988, referred to as the Golden Patricia Agreement (Ex. 371) (trans: vol. 58, pp. 10006-10). NAN witnesses told us about two other agreements that were "on the table" in September 1991, the Musselwhite Planning Agreement and the Musselwhite General Agreement, but we did not receive these as evidence (trans: vol. 330, p. 58050). These agreements were negotiated by NAN/Windigo and some of their Bands with the

companies, the federal government's Department of Indian Affairs and Northern Development and Ontario's Ministers of Northern Development and Mines and of Native Affairs.

Grand Council Treaty #3

Grand Chief Steven Fobister made a clear and eloquent submission on the relief GCT #3 was not requesting from us:

It should not be carried out as some kind of hand-out to Indians. We don't want charity or pity or sympathy. We have maintained our dignity and self-respect as a people through the most extreme trials, and if necessary we can survive indefinitely in the same manner. Also, it should not be done as some kind of affirmative action, in the sense of government forcing employers to hire people they don't want to hire. This would cause more racial friction than there is now, and perpetuate the condescending relationship between Indians and the Euro-Canadian governments. It would also inflame the prejudices of the ill-informed who say Indians get more than they are due.

(GCT #3 Witness Statement #6).

Mr. Donald Colborne, counsel for GCT #3, submitted that its proposals were designed to prevent MNR from "ignoring or perpetually deferring" treaty and Aboriginal rights. Grand Chief Fobister offered the clarification that "probably there will never be a final agreement on what land and resources rights the Treaty #3 nation has." He said "it would be wasted effort, and not appropriate for this hearing, for you to identify with certainty any specific definition" (Witness Statement #6). He submitted that we should proceed on the basis that GCT #3 communities have "environmental rights over their traditional territory, and therefore a place at the management table." Mr. Colborne submitted that the proposals also give the Ojibway people in small forest communities in Treaty #3 area a "fair opportunity to persuade the MNR that they should have access to forest resource allocations."

GCT #3 proposals can be described as having essentially two objectives. The first proposal is that MNR be required to enter, as Mr. Colborne described them, "good faith, compulsory, bona fide" negotiations to identify and to take appropriate actions to prevent, mitigate or remedy effects of the undertaking on the environmental rights of the Ojibway under Treaty #3.

The second proposal would require MNR to enter negotiations to assure the access of GCT #3 communities to the benefits available from participation in the activities of the timber

management planning undertaking equal to those of similarly situated non-Indians. GCT #3 also requested that following approval of the undertaking, all Crown timber agreements and renewals in the Treaty #3 territory would contain a clause reserving in the Crown the right to withdraw up to 20% of the subject timber rights to satisfy agreements made with Indians. Mr. Colborne acknowledged that the 20% figure is arbitrary and could be higher or lower but is intended to provide timber rights to Indians and at the same time provide notice to non-native licence holders that their future allocations would be affected (trans: vol. 403, pp. 69044-47).

Ontario Metis and Aboriginal Association (OMAA)

OMAA proposes what it described to be three "minimum pre-conditions" for our approval of the timber management planning taking.

First, OMAA would require the establishment of a process or forum for the negotiation and resolution of land claims and other claims based on Aboriginal or treaty rights by OMAA's communities.

Second, OMAA proposes that an elected "community based forestry management authority" with significant assured Aboriginal participation be set up in unspecified regions with the authority to manage timber cutting and to issue timber licences.

The third proposal is that MNR designate 25% of land identified for timber harvesting in each of MNR's districts to be allocated for the exclusive use of Aboriginal peoples, who would elect their own representatives to manage this land.

Northwatch

The proposal of the Northwatch coalition, representing the North Shore Tribal Council, the United Chiefs and Councils of Manitoulin and the Union of Ontario Indians, also addressed issues of allocation and the rights of First Nations.

Northwatch proposes that MNR be required to increase allocations of harvesting areas to Anishnawbek operations, to remove barriers to First Nations that currently exist in MNR's allocation practices and to recognize the right of First Nations to practise traditional activities on Crown land.

Northwatch calls for a policy which recognizes that the MNR has a trust responsibility to First Nations and a government-to-government relationship that needs to be publicized in order to promote public understanding of treaty rights. Northwatch also wants the implementation of activities and programs honouring treaty rights.

Northwatch proposed that MNR assist in encouraging Anishnawbek to enter educational fields in natural resource management, hiring students for seasonal jobs while they are pursuing their education and hiring more Anishnawbek as program managers and culture experts within MNR.

FINDINGS

The interest of First Nations and Aboriginal communities in timber management planning can be described in two categories. First is the need to identify and protect their unique values such as traditional lifestyle and cultural sites and the concerns they share with the non-native communities for protection of angling, hunting, trapping and the overall forest environment. The second category pertains to the opportunity to share in the social and economic benefits of the timber management planning undertaking.

Identification and Protection of Native Values

The Ministry of Natural Resources is responsible for promoting involvement of Aboriginal communities early in timber management planning and for collecting information on values of concern to native people. Their traditional lifestyles, the values placed on medicinal plants and religious and cultural sites and the status of treaty and Aboriginal rights are concerns unique to these communities. They share with all Ontarians concerns about a healthy forest environment and jobs. For these reasons, the MNR has proposed a special Timber Management Native Consultation Program (TMNCP) that parallels the standard public consultation program with variations on the first three of the four stages.

Chief Willie Wilson of the Rainy River Band told us that personal communication with a key MNR official was needed to develop a "trust relationship." Chief Wilson added: "If that doesn't happen, you can send all kinds of notices. If you look at some of our elders and talk to some of our elders, paper doesn't mean a damn thing to them" (trans: vol. 316, p. 55949).

This is how the special consultation program will work: the Ministry of Natural Resources will invite participation of all nearby Aboriginal communities (Condition 9(b)). The communities may choose to join the standard consultation process or to have the special

native consultations (Condition 9(d)). In Stage I, MNR will produce a draft Native Background Information Report (Condition 19, Appendix 6). In Stage 2 (Condition 10(b)(i)), those communities electing the special consultation program will be given a copy of MNR's Preliminary Report on Protection of Identified Native Values and asked to comment (Condition 57 and Appendix 10). The community has a final chance in Stage 3 to comment on this report before MNR incorporates it finally into the Timber Management Plan (Condition 11(b)(i)).

The MNR proposes three meetings or consultations with native communities during timber management planning. The first is a community meeting to get input on the draft native background information report in Stage 1 (Condition 9(b)). The communities who opt for the special process shall work out with MNR the forum to be used for discussing the Preliminary and Final Reports on Protection of Identified Native Values in Stages 2 and 3. At the same stages, for the communities who opt for the standard public consultation process, MNR will arrange two information centres upon request at a location convenient to the community (Condition 10(b)(ii) and Condition 11(b)(ii)).

We agree with MNR's proposal to make the Native Consultation Program a voluntary offer whose acceptance or rejection is decided by individual Aboriginal communities. We find that the program addresses some practical matters of concern to the communities. Don Colborne, counsel for GCT #3, opposed MNR offering the program to GCT #3 communities because, he argued, it would undermine the authority of the Grand Council to speak with one voice on behalf of its 25 members. His implication was that MNR could employ a "divide and conquer strategy" in which the individual communities would be persuaded by MNR not to act in their own best interests. We do not accept this argument. The Native Consultation Program is voluntary and it should be available to all Aboriginal communities. We cannot see how this offends the leadership of GCT #3, its ability to communicate with its member communities or its relationship with the Ministry of Natural Resources on timber management and other matters.

We are persuaded that the Timber Management Native Consultation Program can offer the same protection against the adverse impacts of timber management operations for the values of Aboriginal communities as the overall planning process we are approving serves the interests of other northern Ontario communities.

The Opportunity to Share in the Benefits of Timber Management Planning

We are convinced by the evidence we have discussed in this chapter that Aboriginal communities have historically been and are today excluded from sharing in the social and economic benefits accruing to non-native communities from the planning and conduct of timber operations on Crown land. The class EA document recognizes the significance of the benefits of timber management planning and does not exclude Aboriginal communities as recipients: "In general, timber management activities have considerable positive benefits on the socio-economic environment such as opportunities for direct and indirect employment, provision of wood and wood products to commercial markets, generation of revenues, and contribution to community's stability" (Ex. 4, p. 56).

We believe that greater access to forest resources could solve some of the enormous social and economic problems facing Aboriginal peoples in northern Ontario. Our mandate under the *Environmental Assessment Act* is to ensure that our approval of the undertaking meets the purpose of the Act: "the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment." In chapters 2 and 9 we concluded that the social and economic benefits of the timber management planning undertaking are clearly demonstrated for non-natives, northern Ontario communities and the provincial economy. The evidence we heard from the First Nations and Aboriginal intervenors convinces us that their communities are excluded from these benefits for historical reasons and because of today's uncertainties about the meaning and definition of their treaty and Aboriginal rights.

MNR submits that the definitions of treaty and Aboriginal rights and land claims are outside our authority and have yet to be determined by processes involving the federal and provincial governments and the Courts. We are convinced from what we heard that until questions about the rights of native peoples and the responsibilities of government are resolved, these issues will continue to be obstacles to the stability and economic development of these communities. We acknowledge that we do not have evidence in front of us to define exactly what these treaty and Aboriginal rights are; they encompass many matters outside the timber management planning undertaking.

MNR contends that the "broader issue of assisting native people to become more self-reliant and to enhance the economic basis of native communities is being addressed by the federal and provincial governments and various native organizations." The examples MNR gave us describing these "more broadly based initiatives" include the Indian Forestry Development

Program we described above; the Minister of Natural Resources 1991 statement to the legislature concerning the Lac La Croix First Nation (Ex. 1892); access and fishing rights in Quetico Provincial Park and a 1991 agreement on Aboriginal Economic Development in Ontario between Canada, Ontario and OMAA.

MNR acknowledges that Aboriginal communities experience very high rates of unemployment and have limited opportunities for developing a stable economic base. MNR itself identifies the potential jobs and income associated with timber operations in the vicinity of Aboriginal communities. In our view, MNR is asking us to side-step or ignore the issue of the exclusion of northern Aboriginal communities from the benefits of timber management planning. We are approving an application that benefits the forest industry and their employees, provides many direct social and economic benefits to northern communities and to the province generally. We disagree with the MNR that our approval should not provide some access to the same types of benefits for Aboriginal communities situated in the area of the undertaking.

We do not know what the interface is between treaty and Aboriginal rights and the opportunities for these communities to participate fully in timber management planning, including the benefits from timber operations. Our concern is with the latter and it is confined to the application before us.

GCT #3 and OMAA proposed that MNR be required to allocate a percentage of timber licences or timber harvest lands to their members. We do not accept these proposals because we acknowledge that the granting of licences is decided pursuant to the *Crown Timber Act*. We agree with MNR's argument that decisions about allocations of the timber resource are made by granting licences to cut Crown timber. The *Crown Timber Act* provides for three types of licences most commonly used. Order-in-Council licences are granted by the Minister of Natural Resources, subject to the approval of Cabinet, under the authority of s. 3(1) of the *Crown Timber Act*. District cutting licences are granted under s. 2(7) of the *Crown Timber Act* with delegated authority by the district manager and were limited, at the time the Class EA was prepared, to an area of 65 hectares. Forest Management Agreements are the prerogative of Cabinet, subject to the approval of the Lieutenant Governor-in-Council. Specific details about the identity of persons who will receive licences, the length of time the licences will be in force and the rates of payment are generally within the purview of Cabinet and not determined during the development of a timber management Plan. Similarly, the licensing process does not decide the details of the timber management activities the licensee is allowed to undertake; such matters are decided in developing the timber management Plans for the management unit. We agree with MNR's characterization of licences under the *Crown Timber Act* determining who will carry

out timber management operations and the timber management planning process determining how timber operations are done. In our ruling of January 17, 1990, we concluded: "Although the Board may consider the environmental impacts which may arise from the manner by which MNR employs licensing as a method of regulating the activities which form part of the undertaking, this does not confer jurisdiction upon the Board to interfere with existing licensing arrangements, contracts, or other legal obligations within the discretion of the Crown."

In considering the evidence of the intervenors we recognize that each group and the individual communities they represent have different objectives and approaches and it is not for us to dictate the specifics of any opportunity provided to them to participate more fully in the benefits of timber management planning.

The native intervenors have identified a deficiency in MNR's proposal and have convinced us that our approval should address their participation in the activities and benefits of timber management planning. We are persuaded that Aboriginal peoples in the Area of the Undertaking will continue to suffer adverse environmental impacts of a social and economic nature if our approval of the undertaking does not provide a means of mitigating these effects. We are ordering MNR to negotiate with these communities in order to involve them more directly in timber management planning by giving them the opportunity to share in the social and economic benefits enjoyed by other residents of northern Ontario. Therefore in Condition 77, we are ordering:

- 77. During the term of this approval, MNR district managers shall conduct negotiations at the local level with Aboriginal peoples whose communities are situated in a management unit, in order to identify and implement ways of achieving a more equal participation by Aboriginal peoples in the benefits provided through timber management planning. These negotiations will include but are not limited to the following matters:**
- (a) Providing job opportunities and income associated with bush and mill operations in the vicinity of Aboriginal communities.**
 - (b) Supplying wood to wood processing facilities such as sawmills in Aboriginal communities.**
 - (c) Facilitation of Aboriginal third-party licence negotiations with existing licensees where opportunities exist.**
 - (d) Providing timber licences to Aboriginal people where unalienated Crown timber exists close to reserves.**

- (e) Development of programs to provide jobs, training and income for Aboriginal people in timber management operations through joint projects with the Department of Indian and Northern Affairs.
- (f) Other forest resources that may be affected by timber management or which can be addressed in the timber management planning process as provided for in Condition 23(c).

MNR shall report on the progress of these on-going negotiations district-by-district in the Annual Report on Timber Management that will be submitted to the Legislature (Condition 82 and Appendix 20).

The subjects identified above as matters for these negotiations do not comprise an exhaustive list, but indicate the kind of progress we believe MNR can accomplish and accelerate in negotiations with First Nations and Aboriginal peoples. MNR submits that it is already undertaking most of these initiatives.

For the purposes of our approval, we view these negotiations as being part of the timber management planning process and outside of processes dealing with issues of treaty and Aboriginal rights and land claims. We are convinced, however, that the desperate situation of our First Nations and Aboriginal communities cannot improve unless the Ontario and federal governments engage in serious negotiations to resolve treaty and Aboriginal rights and land claims by Aboriginal peoples in the Area of the Undertaking. To this end we are making two recommendations:

- (1) The governments of Ontario and Canada must make a serious commitment to finalize negotiations with Aboriginal peoples which have been dragging on for years. The settlement of land claims is primarily a federal government responsibility and we urge the federal government to accelerate their efforts in resolving land claims by whatever means are available including having these issues decided by the Courts. We further urge the governments of Ontario and Canada to do whatever is necessary to conclude various processes under way to define treaty and Aboriginal rights. This work must involve consultation with and the consent of Aboriginal communities.
- (2) In 1986 only nine Order-in-Council licences and 27 District Cutting licences, involving about 100,000 cubic metres of timber were issued to Aboriginal peoples. The government of Ontario should establish a committee to review its licensing policy as it pertains to Aboriginal peoples and report to the public on its findings. The community should investigate the barriers that exist to granting licences to Aboriginal peoples, to determine the number of licences granted to Aboriginal peoples as well as the size of the area licensed and the volumes of wood. This information should be obtained to provide an historical overview and

to identify the types of licences, such as District Cutting licences or Third Party Agreements, that are involved.

If the committee determines that barriers do exist to providing timber licences to Aboriginal peoples, the committee should consider remedies for this inequitable policy including assistance to Aboriginal communities to obtain licensed areas of sufficient size to provide meaningful employment and income for their people.

CHAPTER 11

THE FUTURE OF OUR FOREST: NEW DEVELOPMENTS AND DIRECTIONS

This approval marks an irreversible change in the management of the great forests of Northern Ontario. But such an enormous enterprise is not transformed in a single moment. Much of the evidence we heard and many of the proposals from the parties looked to the developments that will shape forest management in the future. In this chapter, we focus on these issues and explain those conditions of our approval that will make sure MNR keeps pace with our expanding knowledge of how to sustain the forest. These conditions will also ensure that fuller and better information is available for consideration at the end of the term of this approval, when the Timber Management undertaking once again comes under the scrutiny required by the *Environmental Assessment Act*.

TIMBER PRODUCTION POLICY

Sustainable forestry is at the heart of this hearing. The whole point of timber management is to make sure the benefits of the forest we have inherited are available undiminished to the coming generations. We have already dealt in Chapter 5 (p. 149) with our conditions governing how MNR will set maximum harvest levels in each management unit. At that time we discussed the challenges by other parties to MNR's Maximum Allowable Depletion approach. We also noted there our disappointment that MNR has not completed a new Timber Production Policy for the province. This has been under development for years to replace the 1972 Forest Production Policy, which set an ambitious goal of harvesting 25.8 million cubic metres (9.1 million cunits) each year, beginning in 2020 when it was expected the old forest would all be harvested (Ex. 135, MNR Panel 4 Witness Statement, p. 22).

MNR witness John Cary testified that this level was based on simplistic and outdated assumptions (trans: vol. 29, p. 4882). The demands on our forest have changed enormously in 20 years. MNR's position is that sustainable harvest levels are based on biological, economic and social policy variables (Board Interrogatory 52). Since 1972, the biological capability of the forest has changed because of logging, fire, insects and disease and changes in the size of the land base available for timber management. These changes must be identified and accounted for in the new Timber Production Policy.

The demand for forest products, market prices and the cost of production are economic considerations that influence the amount of timber that is actually cut. Forest management objectives, MNR's silviculture investment, industrial development plans, job creation objectives, ecological concerns and society's changing ideas about permissible forestry practices are political and social policies that directly influence sustainable harvest levels. These must also be considered in developing the new timber production policy.

Mr. Cary told us early in the hearing that the policy was being reviewed and might be changed. In August 1988, we were told this process would take at least a year (trans: vol. 32, p. 5387). As the hearing progressed, we were told of other work being done to update this policy, but no date was set for a new one. The name of the policy is to be changed to "Timber Production" rather than "Forest Production," to reflect its narrow focus. We were told the ministry decided to develop a Comprehensive Forest Policy Framework first, and then a Timber Production Policy. Finally, MNR said that it would wait for the Board's terms and conditions, among other things, before developing a new proposed policy for Cabinet approval. As a result, we have completed our hearing without a clear statement of the overall provincial harvest target, the basis for harvest decisions made at the district and management unit levels.

In the process of working on a new Timber Production Policy, MNR has been collecting and assembling field information in consultation with the forest companies, trying out different types of computer modelling methodology and waiting for the completion of a forest policy framework to give the Timber Production Policy strategic direction. MNR "expects" there will be an "open public participation phase" when timber production options are being developed for the Timber Production Policy (Response to Board Interrogatory 53).

OFIA urged us to set a deadline for MNR to submit to Cabinet a new Timber Production Policy and implementation schedule. The industry also asked us to require the policy to include a statement of the "appropriate level of silvicultural activity" and to require MNR to carry out those renewal activities.

We are uncomfortable that our approval of this application is being given without seeing the new Timber Production Policy, but we are doing so for two reasons. We accept MNR's position that, just as sustained yield management involves fluctuating timber supply, any new timber production policy is likewise open to change and cannot be permanently fixed at one sustainable harvest level. Our second reason is that the conditions of our approval create a network of Local Citizens Committees and regional and provincial advisory groups of experts. In Condition 105, we require MNR to consult with the public and these groups in developing the new Timber Production Policy. We are relying on the input of all the

stakeholders to ensure that the new Timber Production Policy establishes a harvest level capable of sustaining the resource for timber and other forest users.

We are also requiring the new Timber Production Policy to set out quantifiable objectives for a sustainable harvest level and for regeneration effort, including an estimate of the amount required for regeneration funding. Our Condition of Approval requires that this policy be developed for Cabinet consideration by December 31, 1994. This will provide the government ample time to consider the effects of this approval, industry's projected demands and any other policy initiatives as it drafts the new Timber Production Policy. We also want to make sure this policy is never again allowed to get two decades out of date. Our condition requires that MNR update the Timber Production Policy every five years for Cabinet consideration and report the sustainable harvest and regeneration objectives in the State of the Forest Report as described in Appendix 22.

- 105. MNR shall complete and submit for approval a new Timber Production Policy and related implementation schedule by no later than December 31, 1994. The Timber Production Policy shall be updated thereafter every five years.**
- (a) The Timber Production Policy shall be prepared in consultation with the public generally and with input from the various advisory committees described in Appendix 1.**
 - (b) The Timber Production Policy shall provide clear quantifiable objectives for a sustainable level of harvest and regeneration on a 20-year projection as well as for the five-year term of the policy. These objectives shall be provided for the entire Area of the Undertaking and for all individual management units.**
 - (c) The Timber Production Policy shall develop estimates of funding required to meet regeneration objectives for the Area of the Undertaking and for individual management units.**
 - (d) The sustainable harvest level and regeneration objective for the province in the updated Timber Production Policy shall be reported in the State of the Forest Report (Appendix 22, section 1(i)).**

INTEGRATED FOREST MANAGEMENT

From the outset of this hearing, some parties contended that timber management was too narrow a focus and that MNR should be managing all aspects of the forest resource together. In the opening statement for FFT, for example, Joseph Castrilli told us that "a change of title and orientation from the forest management concept to the timber management concept is indicative of the narrowing of the issues that have occurred over the

12 years it has taken to prepare this document and get to this first or second day of hearing" (trans: vol. 2, pp. 224-25). Similar views were expressed by OFAH and NOTOA, both before and after they joined in a coalition. Nearly two years after the hearing started, OFAH asked the board for a ruling to amend the purpose of the undertaking. We denied this motion in February 1990.

Nevertheless, this issue never really went away. Both FFT and the OFAH-NOTOA Coalition urged us to order conditions that would greatly broaden the planning process as proposed by MNR. FFT's Condition 124 would require MNR within five years "to develop and implement an integrated forest management planning process." This detailed proposal includes obligations we believe are impossible to achieve under any circumstances, such as "provide direction to ensure that no wildlife populations decline in the area of the planning unit" (FFT Condition 124, 1 (b)(iv)). Other aspects of FFT's Condition 124 are more realistic, and may even be good ideas, but as we discussed in Chapter 2, we are persuaded by the evidence that integrated forest management is at the stage of being a promising concept of timber management planning. Our approval encourages MNR to accelerate its investigation of the feasibility of forest management techniques and implement improvements as they arise.

The proposals in Schedule B of the Coalition's proposed terms and conditions dealing with the planning process would also have the effect of requiring integrated planning for all the resources in the forest. Again, we do not believe it is possible to implement these processes at this time, given the evidence we have received that the development of quantified objectives for non-timber resources requires considerable scientific research and effort in devising appropriate methodologies.

While MNR has opposed any effort to require integrated forest management in our Conditions of Approval, it has also made clear that it is moving in this direction in its own policy initiatives. A letter from the Hon. Bud Wildman, then-Minister of Natural Resources, stated:

Ontario's forests are a critical element of our environment that must be maintained and enhanced for future generations. To ensure these needs are met, the provincial government and the MNR have announced their commitment to sustainable forestry. The enclosed information package describes how Ontario will shift to forest management based on sustainability.

(Ex. 2315)

In Reply evidence, MNR's assistant deputy minister, policy division, Dr. David Balsillie, indicated that MNR expects to be "a long way down the road" to forest management by 1995-96 but also said the transition would continue during the nine-year term of the Class EA approval sought by MNR (trans: vol. 394, pp. 67896-98).

Although MNR is committed to moving toward integrated forest management, we are persuaded by the evidence that it needs time to do so. As Dr. Balsillie told us, MNR is "in the midst of a dynamic change" and moving to implement forest management "over time" (trans: vol. 394, p. 67898). Many of the specific proposals from FFT and the Coalition could not, as a practical matter, be put into effect now, because the required research and studies have not been completed. Others we believe will never be possible. We are ordering MNR in Conditions 100-109, which require scientific research and technical development, to pursue the work which should set the stage for a transition to forest management. We are ordering in Appendix 20 that MNR report to the Legislature each year the progress it is making on the initiatives it described for us in this field. Our view is that public and political scrutiny will address concerns that these initiatives will never really produce anything once the pressure of this hearing is off. On the evidence, we believe Ontario has committed to integrated forest management and has taken significant steps in that direction. Our Conditions of Approval are designed to ensure this commitment is fulfilled as expeditiously as possible.

DISTRICT LAND USE GUIDELINES

Proposals from some parties at the hearing would have made certain kinds of land use decisions part of the timber management planning process. MNR urged us to leave all land use and land allocation decisions alone, and provided evidence about the District Land Use Guidelines intended to govern those issues outside the timber management planning process.

With the merger in 1972 of the Ministry of Mines and the Department of Lands & Forests into the Ministry of Natural Resources, the new ministry embarked on a review of the existing planning systems. After this review, the ministry devised a new planning system.

The province was divided into three planning regions: Northeastern, Northwestern and Southern Ontario. Strategic Land Use Plans (SLUPs) emerged indicating how the land and water base could best be utilized to meet specific targets and objectives for various natural resources. Some strategies for meeting these objectives formed part of the plan. These

plans were completed in 1982 (Ex. 6, p. 16). The completion of the SLUPs for the three regions led to the next phase of land use planning, the preparation of the District Land Use Guidelines (DLUGs).

The DLUGs contain an inventory of the natural resources in the district, the objectives and level of benefits MNR hopes to achieve in the district and strategies designed to achieve these objectives. (Ex. 6, p. 12). The guidelines include, in addition to the above, descriptions of the district, information on government agencies and land use prescriptions for Crown Lands.

These planning exercises were to form the basis to improve integrated resource management at the district level, each of which could have three to four management units in it.

During the DLUGs exercise MNR held 141 open houses and seven public forums and met with provincial interest groups to review background information and draft plans and proposed strategies. DLUGs were developed for most districts by 1983 and covered most of the Area of the Undertaking except for the MNR districts of Red Lake, Sioux Lookout and Geraldton.

MNR established procedures to amend the DLUGs (Answer to Board Interrogatory 54). These provided for two types of amendments, minor or major. A request for an amendment to the DLUGs could be initiated by anyone. It must include justification for the change and involve public consultation. Major amendments, since they are more far-reaching and more complex, appear to require more intense scrutiny than minor amendments.

The District Land Use Guidelines process itself and the procedure for amending the guidelines were criticized by FFT witnesses and by FFT in its final argument. Of particular concern to us was FFT's suggestion that DLUGs can be amended by the proponent with little or no public notice. If amendments were occurring in the manner suggested there simply would be no way MNR could gain the confidence of the public regarding planning. We reviewed the direct evidence and the cross-examination of FFT witnesses and while concerns were expressed, we could find no evidence that the guidelines in fact were being amended by district managers to accommodate timber management.

It is interesting to note on this matter that witnesses for OFIA felt the process for amending such things as targets in the DLUGs is presently too cumbersome (trans: vol. 224, p. 40692). When asked how many amendments to the DLUG targets were made using the existing process, Dale Munro, the chief forester for Boise-Cascade Canada Ltd., Woodlands Division, and Richard Fry, chief forester for Buchanan Forest Products Ltd., Eastern

Division, indicated they weren't aware of any made in the areas they represented (trans: vol. 224, p. 40690).

From the material presented by the various parties, we accept that DLUGs are only guidelines, and are not binding land use decisions. DLUGs have no legal status. Some districts do not have DLUGs. They are not mandatory. They have not been subject to an environmental assessment. We further accept that they do, however, represent government policy direction; are made at a higher level of planning than the management unit and are made in a broader context than timber management planning.

The Coalition, from what we can gather from Dr. Terrence Quinney's replies under cross-examination (in trans: vol. 346, pp. 60460-70 and trans: vol. 347 pp. 60488-516), advanced a plan which would allocate land use at the unit level. FFT's proposals also would have this effect. As in other decisions we have made, we can't comprehend how decisions about permitted uses on Crown lands can be made at the management unit level. How can provincial management and policy objectives be achieved without provincial decision-making and direction?

The proponent adopted the position that land use allocations cannot be made at the unit level in timber management planning. MNR said decisions regarding various land uses must be made at a province-wide level of planning such as SLUPs and DLUGs, not in an operational plan such as a timber management Plan.

We accept MNR's position that the DLUGs are the instrument to determine permitted uses on Crown land. MNR suggested that the Board not make land use decisions because they are covered in the DLUGs. We have not made any land-use decisions, but we agree with MOEE's submission that the existence of the DLUGs does not eliminate the necessity to consider sound environmental planning, for example when protecting non-timber values. We discuss this matter in Chapter 2, p. 70.

We were pleased to see under cross-examination by FFT counsel Richard Lindgren that Dr. David Balsillie admitted to the need and committed MNR to the task of reviewing and revising the District Land Use Guidelines (trans: vol. 394, p. 67882). That this updating will only occur after a review of the land use and resource management planning system is less acceptable, particularly since some districts don't have DLUGs. Despite our dissatisfaction, we are not ordering revisions of the DLUGs, as proposed by FFT, because we believe this is part of the ongoing process which MNR must be allowed to undertake in consultation with the public. The three committees established in Appendix 1 of our Conditions of Approval will be consulted on any proposed changes to the DLUGs (Condition 110). The

changes also will be subject to review by the Local Citizens Committees and by the general public. MNR shall report on the status of the District Land Use Guidelines planning system review designating permitted land uses throughout the Area of the Undertaking to the Legislature through Condition 82 and Appendix 20 and to MOEE through Condition 114.

GEOGRAPHIC INFORMATION SYSTEMS

A Geographic Information System (GIS) organizes geographic data in ways that allow powerful computers to be helpful in storing, updating, comparing and presenting the information. GIS technology will be essential for the full development of the sophisticated models for resource management that we are requiring MNR to pursue in other conditions of this approval. These include habitat supply analysis and ecological landscape modelling. Witnesses told us such a system would make it much easier to create and update maps, overlays, charts, graphs and other data formats and would make the entire planning exercise more flexible. Dean Gordon Baskerville told us GIS will "make all the difference in the world, it will make as much difference to the forest management in the next decade as computers made in the last decade ..." (trans: vol. 166, p. 29407).

The term GIS usually refers to the combination of computer hardware and software and an organizational structure of data and trained staff. MNR says it plans to spend about \$45 million for hardware and software to establish its Geographic Information System, then \$7 million a year in operating costs. After a pilot project in the Timmins and Cambridge districts, MNR calculated that the system it is planning will require a capital investment of about \$300 per square kilometre in Ontario. All parties to the hearing supported MNR's decision to proceed with GIS. Some, however, like Coalition witness Robert Stewart, a consultant from Saskatchewan, believed the work could be done much faster and cheaper. Mr. Stewart said an appropriate GIS could be put in place for as little as \$20 to \$25 per square kilometre, but we do not believe the system he was describing would be powerful or sophisticated enough for the multi-resource tasks required of MNR in Ontario. It is possible that a system appropriate for more limited uses could be put in place for less money. We were told, for example, that the British Columbia Forest Service has been using GIS, but only for timber, not all resources. MNR has the mandate to deal with a whole range of natural resources. Approximately 40% of the costs of GIS for the province have been attributed to timber management for budgeting purposes. MNR also needs a system that will be flexible enough to be a powerful tool both for province-wide planners and for operational staff looking at data for a single management unit.

Because of this complexity, the significant costs and the need to train large numbers of people, it clearly will take time for MNR to implement GIS fully across the area of the undertaking. The ministry aims to have limited GIS capability in each MNR office by 1997, with work continuing for at least 10 years. Industry witnesses, too, told us they have adopted GIS technology, and will be spending more to expand its applications in the years to come. We accept that this process cannot be rushed, but as the system is completed over the coming years, we expect that it will be increasingly useful to MNR staff who are planning and carrying out timber management. Condition 108 requires MNR to continue its development of GIS. MNR will report its progress on GIS implementation to the Legislature (Condition 82, Appendix 20) and to MOEE (Condition 114).

OLD GROWTH

Old growth forests, a topic of hot controversy on the West Coast of Canada and the United States, have also been the subject of growing attention in the very different circumstances of Northern Ontario, especially in the Temagami area. MNR described some of the viewpoints in its Reply evidence:

There is a broad public concern about the potential loss of these ecosystems. While old trees have historical and cultural significance to many people, others place tremendous value on protecting and studying the diversity of organisms in an "old growth" ecosystem. Still others regard "old growth" forests as overmature trees that should be harvested.

(Ex. 2272, p. 30)

MNR has been slow to respond to this interest. It did not propose any actions on old growth in its original proposed terms and conditions in June 1989, or in its amended proposals in August 1990. Subsequently, MNR has taken some initiatives and proposed other steps, but its apparent reluctance has left some people doubting its good faith, as is seen in comments from Northwatch's Brennain Lloyd and from FFT witnesses.

Old growth ecosystems are important because they are the ultimate expression of the natural processes which define and create our forest environment and the particular ecological characteristics of those species and associated flora and fauna. They are the ultimate expression of the "natural forest." Liquidation of these systems truncates this process and deprives us of what FFT witness Chris Maser described as a "living laboratory" (trans: vol. 283, pp. 50612 et seq.).

The parties to this hearing agreed during negotiations on the proposed terms and conditions that the matter of old growth had to be addressed, but they were not able to agree on what to do. During the hearing, we found Mr. Maser's evidence especially persuasive. He compared old growth forest to "nature's blueprints" and said some should be set aside, but he did not try to tell us how much should be saved in Ontario. Mr. Maser was also candid in saying he believed old growth could not be scientifically defined, because "the description is a characterization, an ecological one. The definition is going to have to build in human values and that still is not going to – there can be no generic definition for old growth in my opinion" (trans: vol. 283, p. 50646).

Dr. Peter Quinby, a witness for Northwatch, told us that only 0.2% of the original white pine forest in the United States and Canada is still standing, and less than 1% of Ontario's original white pine forest remains. We do not quarrel with this estimate; it is clear that not much original white pine forest is left. We are persuaded that steps need to be taken to protect it. But we had difficulty accepting Dr. Quinby's opinion that catastrophic disturbances are not necessary for white pine regeneration. This opinion conflicted with that of Dr. Robert Day of Lakehead University, who in published scientific literature has indicated that controlled burning, shelterwood and clearcut silvicultural systems are needed for the regeneration of white pine. Practising foresters working for MNR and OFIA also differ with Dr. Quinby as to how white pine is regenerated and we are persuaded by their evidence.

In its January 1992 revision of proposed terms and conditions, MNR proposed four measures to deal with old growth during the term of this approval:

1. Investigate the subject of old growth ecosystems.
2. Develop an environmentally sound conservation strategy.
3. Define old growth for Ontario forest conditions.
4. As an interim measure, within two years develop management direction concerning old growth values for use in timber management planning.

At about the same time, MNR established an advisory committee, chaired by Brennain Lloyd of Northwatch, to review the issue of old growth. A 10-member scientific committee, chaired by Dr. David DeYoe of MNR, was set up to help this advisory committee.

In its January 1992 terms and conditions, MNR also proposed that forest stands which meet provincial standards for old growth should be dealt with as Areas of Concern (Appendix 5,

part B, section (1)(a)(iv)). We believe this proposal could go a long way to protect old growth white and red pine, but currently there are no provincial standards for old growth. We believe that once a member of the public identifies an area as "old growth," MNR must not hide behind the fact that provincial standards do not yet exist. Therefore, we are ordering in Condition 103 that until standards and definitions for white and red pine old growth are established, MNR should treat all mature red and white pine stands as Areas of Concern.

FFT set out its preferred way of protecting old growth in its proposed Condition 56. We cannot accept this condition, in part because we believe MNR should consider the report and recommendations of its advisory committee on old growth, which were provided in May 1993, after this hearing concluded. Besides, we believe some portions of FFT's proposal are completely unworkable and impractical, such as its requirement that MNR, within two years, include plant, animal, fungi and micro-organism associations, above-ground and below-ground ecological processes, and biological diversity in a description of old growth for each working group species of tree (FFT Condition 56 (1)(f, g, h)). We believe it is unnecessary to inventory all the things FFT describes, and we believe FFT's definition of biodiversity is unworkable.

Brennain Lloyd, chair of MNR's advisory committee on old growth, urged us to adopt FFT's proposal, even though this would pre-empt much of what the committee was supposed to consider. It is difficult to understand her position. She gave no indication that MNR was not going to accept her committee's advice. Everyone who appeared before the board told us it was difficult to define old growth, and we do not believe it is wise or responsible to define it without scientific documentation and consensus on what it is. We understand Ms. Lloyd's concern, because of MNR's past reluctance to move on old growth, but we are not persuaded to accept FFT's proposal.

We believe the development of a policy on old growth is necessary and we think MNR should respond as quickly as possible. Therefore we order in Condition 103 that MNR develop a conservation strategy, management directions and definitions for old growth white pine and red pine by May 1995, which is two years after the May 1993 date the report was received. For all other species, which are more abundant in Ontario forests according to all the evidence we have heard, MNR will develop interim management direction until the end of this approval, when a policy for all growth will be finalized.

In addition to the 10 areas of red and white pine in late successional stages in Site Region 4E in the Temagami area where harvest already has been deferred pending approval of the conservation strategy, any other mature red or white pine stands identified by any member

of the public or by MNR must go through the area of concern process. No timber management activity will be allowed until the area is surveyed by MNR. If the stand is determined not to be old growth red or white pine, activity can proceed. If it is old growth, it will be dealt with as an area of concern, with harvesting possibly permitted under appropriate safeguards. The criteria used to identify the areas set aside in Temagami, including minimum size, age, stand characteristics and lack of previous human intervention, may also be useful in surveying red and white pine stands elsewhere in the province.

We are aware it will take time to identify all the white pine and red pine ecosystems. Much of this can take place through the timber management planning process. We urge MNR to encourage input from forest users to locate and identify sites even before timber management planning begins, thus reducing the potential for confrontation.

In our Condition 82 and Appendix 20, we are requiring MNR to include in the Annual Report to the Legislature a report on progress in establishing old growth policy and identifying areas to be protected. Condition 114 requires a report also to MOEE.

103. (a) **During the term of this approval, MNR shall investigate the subject of "old growth" ecosystems and develop a policy to provide an environmentally sound conservation strategy, and definitions of old growth specific to Ontario forest conditions.**
- (b) **As an interim measure, within two years of this approval, MNR shall develop management direction concerning old-growth values for use in timber management planning.**
- (c) **MNR shall provide an environmentally sound conservation strategy and management direction concerning red and white pine old-growth values for use in timber management planning across the Area of the Undertaking by May 1995.**
- (d) **Old growth red and white pine stands within site region 4E shall continue to be excluded from harvesting until such a policy is provided and implemented.**
- (e) **For the purpose of this approval, and until a provincially coordinated general policy setting out an environmentally sound conservation strategy is provided which,**
- (i) **defines old growth white and red pine or deems what is old growth white and red pine, and**
- (ii) **provides a specific process to identify and plan for the management and conservation of old growth white and red pine,**

Timber Management Plans must record as values pursuant to Appendix 5, part B, section 1(a)(iv) all sites found to contain communities of old growth white and red pine. Where candidate sites are omitted from the values list and values maps, the Plan must record the reasons the site does not constitute old growth white or red pine.

FEATURED SPECIES

MNR's approach to wildlife management relies heavily on what are called "featured species." By making sure that forest habitat is available for these selected species, this approach aims to provide as well for many other species with similar needs. The species currently featured province-wide are moose for the boreal forest and deer for the Great Lakes-St. Lawrence forest. In addition, there are locally featured species in some areas. Examples we were told about at the hearing were the pileated woodpecker around Lanark, the bald eagle in parts of Northern Ontario, caribou in Terrace Bay and Red Lake and the red-shouldered hawk in parts of the Great Lakes-St. Lawrence region. The *Endangered Species Act* (R.S.O. 1990, c. E.15, s. 5) requires that habitat of a species threatened with extinction must not be destroyed, and MNR's policy is to extend that protection to "threatened" species. If there is an endangered species in a particular management unit, MNR's policy is to make that a locally featured species as well.

Dr. David Euler, an MNR expert on wildlife ecology, said moose and deer were chosen as featured species because they were popular game animals and because a great deal was known about them. He said the ministry estimated that following the guidelines for moose and deer would cover habitat needs for approximately 70% of the vertebrates in the area of the undertaking (trans: vol. 83, p. 13923). Our concern focuses on how to ensure that habitat is provided for the other 30% of vertebrates. Dr. Euler said these species would fall into two categories: those requiring snags (dead or dying trees) and those requiring large areas of mature to overmature forests. He said MNR is "trying to come to grips with that now" (trans: vol. 83, p. 13924) by leaving more snags, if possible, and by "working with the forest management process to try wherever we can to leave larger areas of uncut forest." (trans: vol. 83, p. 13925).

Dr. Euler said of the 30% of species not covered by the moose and deer guidelines, there are no "major problems with the possible exception of the red-shouldered hawk," (trans: vol. 83, p. 13926) and he said MNR is implementing programs to deal with the red-shouldered hawk. All other species are stable and viable. At one point in his testimony, Dr. Euler said MNR might want to add one or more featured species:

See, if we were going to get everything, what we should do – and we may well do this as we evolve – is we would feature moose and deer provincially and then pick one of those area-sensitive mature forest species and feature that as well, like a pileated woodpecker or something. And that might deal with both snags and area-sensitive old, older forests as well. So if we featured maybe three species instead of the one, we probably could provide habitat for everything.

(trans: vol. 83, p. 13935)

The OFAH-NOTOA Coalition proposed adding two featured species which required older forests as habitat: pine marten for the boreal forest and the pileated woodpecker for the Great Lakes-St. Lawrence. Dr. Euler and Jack Ward Thomas, the eminent U.S. wildlife habitat specialist who testified for the Coalition, agreed these species were reasonable candidates to feature, although not the only ones that could be chosen. Dr. Thomas described featured species as a mechanism for preserving biodiversity, saying: "You have to pick an array of featured species that would add up in total, in this witness' belief, to the retention of biodiversity, because we are not ready yet to jump to that conceptual level. I don't think there's any disagreement about that." (trans: vol. 355, p. 61912). MNR, in final argument, acknowledged that it may be necessary in the future to manage explicitly for more wildlife species, but opposed the Coalition's proposal to add two new provincially featured species at this time.

In its final argument, the Coalition said adding two more featured species was only part of what needed to be done to provide habitat for the missing 30% of vertebrates. It said featured species would deal with the spatial configuration of the forest, but submitted that it was also necessary to incorporate the Coalition's proposals on habitat supply analysis and biodiversity into MNR's wildlife management program. Below, we discuss Condition 107 requiring MNR to investigate habitat supply analysis and landscape management methodologies as means of ensuring the preservation of biological diversity. But we cannot be sure what the result of these efforts will be or how long it will take to put the new methodologies to work. The evidence at this hearing clearly supports taking action now to protect more than just 70% of the vertebrate species in the area of the undertaking.

The evidence of Dr. Thomas and Dr. Euler indicates that adding featured species which require old growth, in addition to the existing ones which favour early successional stages of forest, will provide habitat for some of the other 30% of species. Specifically, pine marten and pileated woodpecker make good choices because there is a significant amount of information available, such as Dr. Ian Thompson's work on the pine marten (trans: vol. 383, pp. 66143-50), so that guidelines can be prepared and put into use relatively quickly.

We are therefore ordering in Condition 94 that these two species be added as featured species in the forest regions recommended.

NEW APPROACHES TO MANAGING THE FOREST

MNR proposed to continue examining wildlife habitat supply modelling methodologies and landscape management methodologies as potential means of addressing biological diversity concerns in timber management, in response to proposals by FFT and OFAH. These issues were introduced into the hearing as the parties' thinking on these matters evolved – for example, FFT introduced the term "landscape-based management" on October 1, 1990, more than two years into the hearing.

What do these terms mean? How do concepts such as "featured species," "habitat supply analysis," "landscape management" and "biodiversity management" fit together?

Biodiversity

MNR said that biodiversity concerns are about irreversible loss of flora and fauna as well as damage to ecological systems through human actions (Ex. 2285, p. 17). MNR also described biodiversity as the term was generally used in this hearing:

The holistic concept of biological diversity or "biodiversity" that has entered the vernacular of this hearing refers to more than just trees. It refers to the diversity of all genes, species and ecosystems. In other words if one wants to maintain the "biodiversity" of an area then one must attempt to maintain the diversity of living things and the processes that sustain them ...

(MNR Final Argument, pp. 805-6).

We heard many definitions of biological diversity. FFT submits that there is a general consensus that "biological diversity is an all-encompassing term which refers to the variety and variability of living organisms and the ecosystems in which they occur, and which includes genetic diversity, species diversity and ecosystem diversity" (FFT Final Argument, p. 273).

In the featured species approach currently used by MNR, concerns about wildlife are taken into account by attempting to meet the habitat needs of a single species on any one site in the forest (Ex. 2275, p. 3). In a diversity approach, the goal is maintaining the diversity of wildlife species through the provision of habitat diversity (Ex. 2275, p. 31). We heard consistent evidence from FFT, MNR and OFAH witnesses that featured species

management is compatible with management for biological diversity, but that the featured species approach was not sufficient in itself to maintain biodiversity, and that the landscape-level biodiversity concerns should take precedence (trans: vol. 390, p. 67218; trans: vol. 402, p. 68941; MNR Final Argument, p. 808).

Landscape Management

MNR told us landscape management can be described as the provision of ecosystems necessary to maintain viable populations of all species. FFT defines landscape management as "a systematic planning approach which seeks to ensure the continued existence of all ecosystem types in proportion to spatial and temporal patterns in the natural forest" (FFT Final Argument, p. 305). As described by John Middleton, a witness for FFT:

The goal of landscape management is a landscape mosaic with important characteristics that continue through time. This does not mean that the landscape is frozen in time; each individual piece of land changes with time, and most areas (excluding parks and other reserves) remain available for timber management. However, the kinds and amounts of resources extracted are adjusted (in the sense of adaptive management as described by Baskerville, Exhibit 972, Transcript Volumes 164-69) to match the rate of replenishment of the same kinds and amounts. The "interest" is collected without touching the "capital."

(Ex. 1711, p. 39).

Landscape management requires, as a basic tool, description of the landscape through an ecological landscape classification system (ELC), which we discuss further beginning on p. 394. Habitat supply modelling (HSM) and habitat supply analysis (HSA) are methodologies used to explore future wildlife habitat availability under different management scenarios. We discuss HSA/HSM further beginning on p. 398.

How did the parties' thinking about these concepts evolve?

MNR maintained that concern about biodiversity is reflected in many recent Ministry publications and initiatives. In its Reply Panel 4 Witness Statement, MNR claimed that its past work on provincial parks, ANSIs, wetland inventory, conservation land tax rebate system, endangered species program, fish and wildlife technical guidelines and components of silvicultural guides have all contributed to the maintenance of biodiversity. Maintenance of biodiversity has been highlighted in MNR's Direction '90s, proposed Wild Life Strategy, several Sustainable Forestry initiatives and the Endangered Spaces initiative. MNR said

that an interim position on biodiversity was scheduled for approval in the spring of 1992 with a draft policy framework being developed for public review by the end of 1992 (Ex. 2309, p. 36). We do not know whether these deadlines have been met.

MNR's Wildlife Working Group, which was established in 1989, released its proposed provincial wildlife strategy, *Looking Ahead: A Wild Life Strategy for Ontario* (Ex. 2065), in May 1991. Commenting on the Ministry's existing Featured Species Policy, the WWG said it "...recognizes the practical advantages of this approach, but does not consider it conducive to an ecosystem approach or to the maintenance of biodiversity, and therefore recommends that it be re-evaluated" (Ex. 2065, p. 68). The WWG recommended that the Ministry adopt an ecosystem approach to management, improve the management of public lands for their wildlife values, and maintain wildlife habitat diversity on forest lands.

MNR says that the key concepts that helped them formulate their approach to conserving biodiversity arose at a series of workshops on evaluating effects of timber management on wildlife, and that FFT was also influenced by these workshops. The four workshops were held in the spring and fall of 1990 by ESSA Environmental and Social Systems Analysts Ltd. From these workshops came two papers: *An Investigation into the Effects of Timber Management on Wildlife* (Ex. 2274) and *Wildlife-Habitat Management Strategies* (Ex. 2275).

MNR's featured species approach to wildlife management was described to us in the presentation of MNR's evidence, and we have already discussed it in this chapter. At that time, MNR witnesses told us that this policy was under review, and that a background report had been commissioned which would set out the advantages and disadvantages of the featured species approach and three alternate wildlife management strategies. That report (Ex. 2275), released in March 1991, indicated that although management for landscape diversity is more complex than the other alternatives examined, it would provide a number of significant benefits. Both FFT and MNR quoted from the report to illustrate the reasons for pursuing diversity on behalf of wildlife in forest management:

- biodiversity is assumed to lead to ecosystem stability and resilience;
- implicit in the maintenance of biodiversity is the prevention of species extinctions;
- biodiversity contributes to multiple-use management of forest resources; and
- biodiversity is a key to maintaining future options and forest management flexibility. (Ex. 2275, p. 33)

The report *An Investigation into the Effects of Timber Management on Wildlife* was released by MNR and ESSA in May, 1991. It recommended a plan of study into the effects of timber management on wildlife in Ontario, developed through the collaborative effort of participants in the workshops. The formal objective of the research plan was to provide MNR with an improved understanding of the effects of timber management on wildlife other than moose and deer and the effectiveness of timber management guidelines in modifying those effects. The report emphasized as the first research priority the need for an integrated ecological landscape classification (ELC) system, which would provide a common framework for timber and wildlife habitat management. Other workplan components are: documentation of species distributions; development of wildlife habitat models; comparison of natural and human/management caused disturbance; experimental interventions in management plans; and evaluation of guidelines for sensitive species. Other initiatives that would tie in to this research would be wildlife population monitoring, growth and yield modelling, and development of a geographic information system.

MNR stated in Reply evidence that it is now moving towards managing for biodiversity:

As a result of these various influences, MNR is moving from a wildlife management approach which focuses primarily on individual species to one which strives more explicitly to conserve biodiversity. In doing so, MNR recognizes that there will be a transition period, as it seeks to define biodiversity related objectives for Ontario and to decide upon appropriate means to achieve those objectives.

(Ex. 2272, p. 36)

We were told by MNR witness Dr. Abraham that the Ministry gave its approval in principle to embark on this research program (trans: vol. 390, p. 67223). MNR Reply Panel 3 witnesses described MNR's work on a number of the program components, which they say will contribute to MNR's ability to manage for biodiversity:

- improvements to the Forest Ecosystem Classification (FEC) system and development of an Ecological Land Classification (ELC) system;
- mapping of the FEC/ELC units to provide an inventory of ecosystem units;
- implementation of a geographic information system (GIS) to facilitate landscape level analysis and management for a diversity of ecosystems;
- development of information about growth and yield under different management regimes;

- development of landscape ecological models for calculating diversity measures and predicting changes in diversity under various management scenarios, as part of the Forest Fragmentation and Biodiversity project of the Old Growth program;
- development of landscape pattern analysis techniques as part of the Moose Guidelines Effectiveness Monitoring program.

None of the parties except MOEE agreed with MNR's approach.

OFIA submits that there are legal and practical difficulties with the proposition that ecosystem management or management to achieve biodiversity should be dealt with by the Board. From a legal perspective, OFIA submits that ecosystem management and management to achieve biodiversity are not part of the undertaking, arguing that these concepts are grounded in land use planning rather than timber management (OFIA Final Argument, pp. 63-64 and pp. 70-71).

OFIA opposed MNR's proposal, and instead proposed that the conceptual tools of ecosystem management, habitat supply analysis and biological diversity are matters that should be developed and pursued according to the priorities assigned to them by the Provincial Technical and Policy committees proposed by OFIA in its terms and conditions relating to planning.

FFT submits that timber management activities can potentially adversely affect wildlife habitat and biological diversity (FFT Final Argument, pp. 269-70; trans: vol. 402, p. 69271). FFT also argues that MNR's proposals to mitigate impacts on wildlife and biodiversity are insufficient (trans: vol. 402, p. 68929) and that many of MNR's initiatives such as the featured species approach and wildlife guidelines and manuals are confined to game species, so it must expand these programs to provide for the needs of all wildlife species. FFT points to regulations under the *National Forest Management Act* (36 CFR Ch. II, s. 219.26 and s. 219.27(g)) that require the U.S. Forest Service to manage forests in a manner which maintains or enhances diversity and submits that MNR is seriously behind other resource management agencies in conserving biodiversity. FFT submits that the goal of maintaining biodiversity should be expressed in the Board's decision and in the Conditions of approval:

...FFT urges the Board to impose a condition which stipulates that the MNR should ensure that timber management activities are planned and carried out in a manner that does not adversely affect or reduce biodiversity within the area of the undertaking.

(trans: vol. 402, p. 68932).

FFT states that the fact that MNR lacks a provincial wildlife or biodiversity policy "demonstrates that timber is still king" (trans: vol. 402, p. 68934). It does not trust MNR's approach, saying in oral argument:

At most the MNR has committed only to examine landscape management methodologies. In FFT's view, this condition really amounts to nothing and, indeed, given the MNR's track record in developing other initiatives like the new timber production policy, like the long promised review of the district land use guidelines, FFT simply has no confidence that the MNR will move in an expeditious manner towards biodiversity management in this province, and that is why we submit that the Board should impose clear conditions with clear deadlines so as to ensure that the MNR does in fact move beyond the status quo of featured species management towards broader biodiversity management.

(trans: vol. 402, pp. 68937-38).

FFT opposed MNR's proposed condition and proposed its own Conditions 53, 54, and 55. FFT's Condition 53 would require that MNR ensure: that timber management activities do not reduce, eliminate or otherwise adversely affect the existing and potential future level of biological diversity within the area of the undertaking, or any forest management units, eco-districts, or eco-sections; that biological diversity is maintained by providing an ecologically sound abundance and distribution of wildlife communities and species and the provincial level and within forest management units, eco-districts and eco-sections; and that no wildlife populations decline at the provincial level nor in the long term within forest management units, eco-districts or eco-sections as a direct or indirect result of timber management activities within the area of the undertaking. Within five years, MNR would have to, where feasible, replace forest management units with "eco-sections" or "eco-districts" whose size, shape and boundaries reflect ecosystem integrity.

In its Condition 54, FFT would require MNR to develop and implement a landscape management planning system within five years to identify, maintain and protect all ecosystem elements. With this landscape management planning system, MNR would develop a standardized description of natural disturbance patterns for each management unit, which would be used to guide silvicultural planning towards simulating natural disturbance patterns and ensure that no ecosystem types be eliminated from the landscape as a result of timber management activities.

MNR would also be required to complete, within five years, an "ecological landscape classification" (ELC) system which meets several objectives set out by FFT, including what we see to be an impractical objective to "cover the complete land base of Ontario and be integrated into relevant areas beyond the provincial boundaries" and to conduct an "on-going

multi-taxonomic habitat inventory to determine how timber management is affecting the integrity of landscape units, eco-districts and eco-sections."

MNR's Reply Panel 5, in commenting on FFT's proposed Condition 53, admitted that "the definitions used are commonly understood, and the stated objectives are consistent with our own" but maintained that the specific levels of resolution (e.g. eco-section) are overly fine (Ex. 2295, Tab 3, p. 22). We agree with MNR's view that planning at the level of eco-sections would be impractical and might impede attainment of the larger scale objectives. Furthermore, we do not believe FFT's proposals are necessary for maintaining biodiversity.

MNR Reply Panels 3 and 5 witnesses explained that, while they might agree conceptually with FFT's proposed terms and conditions on biological diversity, they would have problems applying them on the ground. Mr. Kennedy observed that MNR must look at FFT's proposed terms and conditions as legally binding conditions which MNR would be accountable for implementing. MNR argues that they are investigating theories of management but they cannot make the final determination until they have developed the analytical tools and determined which approach is most feasible and necessary. Dr. Abraham said that MNR is only at the point where it is developing techniques for measuring biological diversity and techniques for landscape management, but not at the point where it could ensure biological diversity is maintained. In the words of Mr. Freidin:

MNR can't promise to deliver something which cannot be described in black and white...it's difficult to set specific objectives as to what will actually be done to try and address biodiversity, and I'm not being apologetic for that, the witnesses came forward and said that's just the state of science at the present time.

(trans: vol. 398, p. 68318)

Dr. Abraham and Mr. Kennedy also argued that biological diversity is affected by more than timber management, that MNR is in the process of developing a ministry-wide policy framework for biodiversity, and shouldn't be constrained by any terms and conditions mandated for timber management. MNR also argued that landscape management would require decisions to be made at management levels well above the forest management unit level (concerning which values to manage for, and what the objectives would be) before it could be used operationally in timber management planning (MNR Final Argument, p. 825).

OFAH agreed with FFT that MNR's reliance on featured species is not adequate to meet biodiversity concerns. They also submitted that MNR's response to the concern of

biodiversity has been to say, in effect, "We don't know enough. Let's do some more studies. We will convene a committee to review the matter. We will defer on-the-ground action at an operational level to some indeterminate time in the future when better resolution of the issue is available" (OFAH Final Argument, vol. 2, p. 4). OFAH said that its biodiversity proposal encompasses the key elements of biodiversity management proposed by FFT witnesses, but that it is practically implementable. The Coalition submitted that it is not adequate to defer action until the ultimate biodiversity management approach is developed. Instead, it advocated immediate interim action at the same time as efforts are ongoing to improve and refine the approach.

OFAH's approach to biodiversity management, proposed in its Appendix B, Conditions 23 to 25, called for the current supply of forest types to be analyzed and documented, and a minimum of 10% of the total area of each forest type in the management unit to remain in the oldest seral state in perpetuity. The Coalition described its approach to the maintenance of wildlife species as an integrated hierarchical approach to managing terrestrial ecological impacts involving a broad biodiversity framework, a selection of a small number of provincially featured species and dealing with locally featured species where they arise. We have accepted the Coalition's proposal to add two provincially featured species (see p. 389 where we discuss Condition 94(c)).

OFAH proposed that MNR develop habitat supply analysis models for the four provincially featured species, and use existing models available from other jurisdictions until refined models are developed for Ontario. The Coalition did not ask that MNR adopt any particular model. What they asked is that MNR begin now to predict timber management impacts on wildlife habitat and populations so that section 5(3) of the *Environmental Assessment Act* can be satisfied (trans: vol. 405, p. 69350).

Habitat Supply Analysis

Habitat supply analysis (HSA) and habitat supply modelling (HSM) (these terms are used interchangeably) are methodologies that can be used to predict wildlife habitat supply availability under different management scenarios. The idea behind HSA/HSM is to take an inventory of current conditions, apply some rules about how those conditions change under natural succession and how they change in response to different treatments or human interventions, and put all that information into an inventory prediction model.

MNR commissioned a study on habitat supply modelling from the ESSA consulting firm. The report, *Habitat Supply Analysis and Modelling: State of the Art and Feasibility of*

Implementation in Ontario (Ex. 2068), was released in June 1991, and recommended that "adoption of HSA as an operational tool within the Ministry could help to address current limitations of the planning process by providing foresters and wildlife biologists with quantitative estimates of the wildlife habitat(s) afforded by alternative management proposals" (Ex. 2068, p. i). The recommendation which OFAH then based their proposals on is "in the short term, on the order of two to three years, it should be feasible to implement a primitive form of HSA, using simple non-spatial HSMs in which habitat is defined simply by development state of different FRI stand types" (Ex. 2068, p. ii). The authors also concluded that the sophisticated HSM needed would require spatial analysis, and that implementation across the province would take 10 to 15 years because it would need an operational GIS and digitized data. A small number of individual units could be operational within five years.

MNR's response to that report was given in Reply evidence:

MNR intends to continue its investigation of both spatial and non-spatial habitat supply models, by adapting and applying those models to local situations as the need and opportunity arises. Based on knowledge and information gained through these local applications, wider implementation of appropriate modelling methodologies will be undertaken, with progress reported in accordance with Condition 93.

(Ex. 2272, p. 41)

MNR witness Bob Watt described a number of experimental projects that the Ministry has under way in its investigation of HSA (Ex. 2272, pp. 30-40). In response to OFAH's proposal that at least non-spatial HSA be undertaken now, Mr. Watt described several obstacles to the implementation of HSM:

- it is difficult to determine habitat quality information from existing FRI descriptors and this constraint will continue until mapped FEC or enhanced FRI products are available;
- spatial habitat supply models are limited by the lack of GIS capabilities and digitized land cover inventories at the district level;
- detailed knowledge of the relationship between most Ontario wildlife species and specific forest conditions is limited or absent;
- current inventory projection models were developed for conditions elsewhere, and would need to be tested and calibrated for use in Ontario;

- MNR has so far only developed projection models for even-aged management systems;
- MNR needs a better understanding of growth and yield; and
- field managers have to be trained to use HSM.

OFAH relied on the evidence of its witnesses Jack Ward Thomas, Jeffery Patch and Richard Page to claim that HSA "is not rocket science" and that it is not incredibly difficult, expensive or burdensome. They presented an example of a simple HSA analysis that Dr. Page and Mr. Patch performed in two hours with a hand calculator, using information from an existing timber management plan, to predict the impacts of timber management on marten habitat.

We found the evidence of Bob Watt and Gordon Baskerville, who were both involved in developing HSA in New Brunswick, to support MNR's position that the ministry's approach is not significantly different from that used in other jurisdictions. Mr. Watt argued that we have no evidence of widespread habitat supply shortfalls in the area of the undertaking, and therefore MNR has more time than other jurisdictions to test habitat relationships and implement HSM (trans: vol. 390, p. 67156). He pointed out that British Columbia's HSA is only being used in two prototype projects, and that in the United States, several experiments with HSA have been outright failures.

Dr. Baskerville suggested that the integration of timber management with HSA took about 10 years in New Brunswick, but pointed out that it would be longer in Ontario, because four or five of Ontario's management units are each larger than the total Crown Land of New Brunswick (trans: vol. 166, p. 29599). Dr. Baskerville suggested that it would take five years to have HSA up and running on one management unit, and that it could only practically be done in an incremental way starting with one or two units. His main message is that you couldn't start on the whole of the province at once, because it is not technically feasible (trans: vol. 167, p. 29631).

We find that mandating the use of HSA in timber management at this time is premature, and we agree with MNR that its proposed Condition 90 is a reasonable response to suggestions regarding the use of HSA. This has been adopted to our Condition 107:

107. During the term of this approval, MNR shall continue to examine wildlife habitat supply modelling methodologies, and landscape management methodologies as potential means of addressing biological diversity concerns in timber management planning.

This condition also requires MNR to continue examining landscape management methodologies and habitat supply modelling methodologies. We are confident that the planning process we have ordered is flexible enough to accommodate either the featured species approach or landscape management approach, if that is what MNR determines is necessary. We disagree with MNR's concern that clearcut size limits may restrict their ability to move towards landscape management. We believe that our Condition 27 requiring a range of clearcut sizes up to 260 hectares, with exceptions under certain circumstances, will give MNR the flexibility it needs to implement landscape management.

We believe that the reporting requirements to the Legislature in Condition 82, Appendix 20 and to MOEE in Condition 114 will ensure that MNR will follow through with its investigation into landscape management and habitat supply analysis methodologies.

Forest Ecosystem Classification Mapping

MNR began developing Forest Ecosystem Classification in 1979. By 1992, it had completed classifications for three areas: the Claybelt, northwestern Ontario and the Algonquin region (trans: vol. 389, p. 67067). These were designed to assist MNR foresters and field staff who, recognizing that they needed information beyond what could be found in the Forest Resource Inventory, asked for help in identifying mature, commercial timber stands for harvest and other silvicultural decisions. The ecosystem classifications identify non-geographically specific "operational groups" by vegetation conditions (i.e., layering of trees, shrubs, herbaceous and mosses), soil types and some physical parameters likely to be encountered. The existing forest ecosystem classifications are limited to mature commercial forest conditions, with little applicability to purposes other than timber management. The classifications describe ecosystem units at the stand level only, and at a point in time. They do not describe forest succession or other factors descriptive of the ecosystem generally. The FEC programs that have been completed to date cover three areas of the province and the classifications for these three areas are not standardized or integrated. Hundreds of MNR and forest industry staff have been trained in the interpretation of the Forest Ecosystem Classifications and use them to add to site descriptions when they are developing silvicultural ground rules.

Demands are coming from other forest users to "refocus" the classifications so that they can be used for wildlife management, biodiversity, conservation and landscape management. The 1990 Sustainable Forestry Initiatives committed MNR to work on an Ecological Lands Classification (ELC) program so that there will be a "completed classification for forest ecosystems in the area of the undertaking." MNR is building on the existing information

base, expanding the classifications to cover non-forested lands and intends to eventually produce a standardized approach for the classification of all ecosystem types to cover all of Ontario.

As part of the ELC program, MNR regions' science and technology units are exploring a variety of mapping and inventory technologies. This mapping project, which is part of INRIS, involves developing a technique to produce mapped forest ecosystem classification polygons. MNR's objective is to develop a technique within two to four years, and to demonstrate the technique by producing a few "prototype" maps at both the provincial scale and community scale. The eventual end product would be maps showing ecosystem groupings with similar soils, vegetation, climate and topography but Dr. Osborn told us that the digital base maps needed as part of this process will not be available for the entire province until the year 2004 (trans: vol. 389, p. 67020). MNR's position is that mapping ecosystems for the province will be an expensive undertaking. "MNR has yet to explore fully the feasibility, options and costs for delivery of such a program. Given the current uncertainties concerning the scope and cost of the approach, a flexible delivery mechanism and schedule is required" (Ex. 2272, p. 16).

In the words of the Coalition's witness Dr. Quinney, a precondition to applying the 10% rule of the Coalition's biodiversity proposals is the ability to prepare a FEC map. Dr. Quinney said that derived FEC maps could be made using FRI data together with the FECs and this is "being done now" (trans: vol. 350, p. 60976). We are convinced by the evidence of MNR witnesses Dr. Osborn and Bob Watt that Dr. Quinney and the Coalition do not fully understand the limitations of FEC/FRI mapping. Dr. Osborn said that if MNR were required to try to derive this information from existing data sets, they could go into the field with "an army of people and a whole array of ground surveys ... the estimation was that sort of process was at least as traumatic as the forest resource inventory which cost \$50 million to cover two-thirds of the province" (trans: vol. 389, p. 67017). We reviewed the evidence of Dr. Osborn and Mr. Watt for MNR Reply Panel 3 and we are persuaded that the mapping of FECs is experimental and cannot be used in the near term as a management tool. This is one of the reasons we reject the OFAH's biodiversity proposals.

FFT proposed that within five years we should require MNR to replace Forest Management Units with ecosystem management units. Its witness Roger Suffling testified that Environment Canada has already defined 17 ecological regions, and within those, 79 eco-districts in Ontario. He said that if the eco-districts were broken into 10 to 20 eco-sections, you would end up with between 750 and 2,500 eco-sections (trans: vol. 295, p. 52741). We reviewed the evidence of MNR's witness Peter Uhlig and conclude that mapping of eco-sections has not been done for Ontario. In Mr. Uhlig's view the number of eco-sections that

could be identified in the area of the undertaking would number in the "hundreds if not thousands" (trans: vol. 389, p. 67064). In its Reply Panel 5 Witness Statement MNR concludes that the number of eco-sections in the area of the undertaking would number in the tens of thousands (Ex. 2295, Tab 3, p. 22). Whichever estimate is correct, we agree with MNR that the level of resolution in FFT's proposed Condition 53 is too fine, and that planning and protection at the level of eco-sections would be impractical and might well impede attainment of the larger scale objectives. We conclude that it is premature and impractical to replace existing management units with eco-districts and eco-sections for the purposes of timber management until this concept has been clearly defined and its supporting tools, technology, maps and manuals are developed.

We find that the Forest Ecosystem Classification approach has been demonstrated to be essential to improving knowledge of the forest for timber management purposes and we are ordering in Condition 25(b) that the classifications be used in developing silvicultural ground rules and in Condition 97 that MNR continues its work improving the FEC program.

GROWTH AND YIELD STUDIES

Ontario's foresters need better tools for estimating and measuring the results of timber management. MNR argued persuasively that the effects of harvest, renewal and maintenance must be assessed in combination – even as a package – to truly understand what is happening in our forest. We also agree with MNR's position that these timber management effects must be measured against the natural changes that occur in the forest environment.

Although some information is available at the local level about silvicultural successes and failures, MNR concluded during the course of this hearing that foresters need more comprehensive growth and yield information and began to develop a provincial strategy.

While some permanent sample plots were established as early as the 1930s to measure growth and yield, it was only in the late 1950s that two major province-wide studies were carried out, MNR witness Rich Greenwood explained (trans: vol. 392, p. 67423). These studies led to the development of provincial normal yield tables by Walter Plonski and of provincial cull tables. Mr. Greenwood said those two studies were the last comprehensive province-wide effort to develop growth and yield information until MNR launched its new initiative in 1989.

Responses to a draft paper on growth and yield strategy made it apparent that wildlife biologists, geneticists and many others needed this kind of information and MNR broadened its aims. The program, as explained in MNR's Reply 3 Witness Statement (Ex 2272, pp. 24-26) should produce improved information in the short term and high-quality data in the long term, linked to site, forest structure, silvicultural treatment and natural events.

MNR told us it would improve growth and yield information from existing data, conduct new field work using old sample plots and newly established permanent plots and develop new models for predicting growth and yield. It is especially important to understand how a certain species of tree on a given site will respond to particular treatments. In its table of estimated one-time costs stemming from its proposed terms and conditions, MNR said it would spend \$10 million on permanent sample plots for the growth and yield program (MNR Reply 4 Witness Statement, Ex. 2309, p. 27). We are ordering Condition 100:

100. MNR shall design and implement a provincially coordinated program to obtain further information on forest growth and yield as influenced by site, forest structure, silvicultural treatments and natural events.

We are requiring MNR to provide progress reports on this to the Legislature (Condition 82 and Appendix 20) and to MOEE (Condition 114).

ALTERNATIVES TO CHEMICAL PESTICIDES

In Chapter 7 we discussed tending and protection, and described MNR's initiatives in research and development of alternatives to chemical herbicides and insecticides. Condition 102 reflects MNR's commitment, as part of the Sustainable Forestry Program, to investigate alternative control methods and to support research to improve tending and protection methods in future. We described the Ministry's Vegetation Management Alternatives Program (VMAP) in Chapter 7, beginning on p. 241. Condition 102 also ties into MNR's stated policy to "...actively promote and support research and development on insect control techniques which will reduce our reliance on chemical insecticides" (MNR Policy FR 04 10 01, Ex. 604A, p. 148).

FFT submitted that this condition is too vague to achieve the goal of the VMAP program, which is to "gradually reduce dependence on herbicides in Ontario's forests" (Ex. 2291, p. 4).

The Industry objected to MNR's focus on researching alternatives to chemical pesticides. OFIA submitted in its Condition 63(e) that MNR should encourage and financially support

research and development for the registration of additional insect control agents, including chemical insecticides, and in its Condition 86(b) that MNR should encourage and financially support research and development for the registration of additional herbicides.

We approve of MNR's approach to researching alternatives to chemical pesticides, as laid out in Condition 102:

- 102. MNR shall ensure that tending and protection programs are conducted in accordance with current scientific knowledge applicable to Ontario's forests by maintaining policies and procedures that ensure proper and safe use of registered and approved products; investigating new technologies; testing alternative control methods; and supporting research initiatives.**

We require MNR to provide progress reports on this initiatives to the Legislature in Condition 82, Appendix 20, and to MOEE, Condition 114.

FULL-TREE HARVESTING

All parties agreed on Condition 101, requiring MNR to study the effects of full-tree harvesting and full-tree chipping on long-term forest productivity. In Chapter 5 (p. 185), we discussed the issue of full-tree harvesting, which some people fear may rob future forests of essential nutrients. As we explained there, we support MNR's proposed study, but do not find sound reasons to impose restrictions immediately, as MOE and FFT wanted us to do. MNR said it was developing interim direction concerning site productivity and would summarize good practices by vulnerable sites in its new Environmental Guideline for Timber Management Activities (Condition 94(b)). We also were reassured by evidence from OFIA Reply witness Bill Roll about new equipment in widespread use which leaves more slash material and small diameter trees on harvest sites.

- 101. MNR shall design and implement a study pertaining to the effects of full-tree harvest and full-tree chipping on long-term forest productivity.**

As with other proposals for research and development, MNR is required to report its progress on this study to the Legislature (Condition 82, Appendix 20) and to MOEE (Condition 114).

VISUAL RESOURCES

Again and again at our hearing, citizens complained about the ugliness of the forest after harvest. They told us clearcuts looked like wastelands. We heard from remote tourist operators, road access tourist operators, cottagers and the public in general, mostly about the visual effects along primary or secondary roads, around lakes and rivers, or at portages. People saw them while fishing or skiing, or when travelling by car, boat or canoe. They told us timber harvest could destroy wilderness experiences and send vacationers elsewhere.

In its Panel 10 evidence, MNR discussed the development of the Timber Management Guidelines for the Protection of Tourism Values, which began when the Northern Ontario Tourist Outfitters Association asked MNR to prepare guidelines to protect scenic values. Besides tourist operators, the guidelines were intended to benefit "a wide variety of user groups," according to the document itself, including "cottagers, campers, canoeists, bikers and cross-country skiers." (Ex. 379, p. 1). MNR witness Cam Clark said the guidelines offer "a range of alternative solutions to general problems concerning aesthetics, concerning remoteness, concerning noise and visual amenities" (trans: vol. 82, pp. 13699-700). Among other things, the guidelines describe ways foresters can design harvest cuts so to minimize the aesthetic damage. Skyline reserves, for example, can be designed so that all the slopes which can be seen from a tourist lake are left uncut.

Even after the guidelines were put in place, many people remained dissatisfied, and we heard these concerns at our community hearings. In Timmins, Roy Bennett of the Gogama Tourist Operators Association told us the current reserves around lakes were too small to protect tourist interests (trans: vol. 234, pp. 42585-86). Vern Hollett, representing the Sioux Lookout/Hudson Tourist Outfitters Association, said all lakes with tourism value or fishing value should have skyline reserves (trans: vol. 329, p. 57856). Gary Wogenstahl, a tourist outfitter and bait fisherman, complained at the Dryden community hearing about clearcutting to the edge of "what was to be a scenic route" (trans. vol. 141, p. 24070). Marvin Wisneski, a witness in Red Lake, said 30-metre reserves around lakes are often ordered to protect fish, when a larger buffer is needed for wildlife and tourism.

Against this background, we were somewhat surprised that the parties at our hearing could not reach agreement on a condition dealing with visual resources. We were even more astounded when MNR withdrew its proposal calling for investigation of available analytical methods related to visual resources management. MNR said in its final argument (p. 804) that this condition "had not been the subject of much interest by other parties." What about the interest of the public owners as expressed repeatedly to us at the community hearings?

We are satisfied, however, that some of MNR's research initiatives will provide information relevant to visual resource management. This includes the Tourism Effects Monitoring Program, part of the Old Growth Forest Fragmentation and Biodiversity project and an investigation trying to link scenic values to Forest Ecosystem Classification types (MNR Reply 3 Witness Statement, Ex. 2272, p. 34).

Currently, visual resource management issues are addressed on a case-by-case basis when a timber management Plan is prepared. There were so many concerns expressed at our hearing that it is obvious more consideration will have to be given to aesthetics. It will take the efforts of experienced technical people to design cut patterns and reserve widths satisfactory to the people affected by a harvest. We were impressed by the evidence of several MNR staff who have worked in this area, especially Bob Patterson, who has considerable experience in the protection of portages, and Craig MacDonald, a specialist in canoe routes. Mr. Patterson and Mr. MacDonald were both called as witnesses by Venture Tourism Outfitters Association.

We accept MNR's withdrawal of its proposal, but we are ordering Condition 24 requiring a section on Visual Resource Management in every Plan. This will give the public an opportunity to raise concerns early in the process on such matters as clearcutting to a primary or secondary road, small buffers along canoe routes, inadequate maintenance around a portage or poor skyline reserves. MNR and the plan author will be required to discuss the matter with those affected and to provide a rationale for their decision in writing in the Plan.

We do not see this as frivolously delaying planning. We are aware there will be harvest along some roads, and some lakes and rivers where the public will not be directly affected because there are no cottage lots, ski trails, canoe routes or tourist camps and therefore not the same demands. The goal is to identify unacceptable visual effects of harvest and through discussions try to reach a consensus on how to deal with the conflict. This is already done to some extent on an informal basis, but in Condition 24 we are ordering that complaints about visual resources be addressed in the actual Timber Management Plan with a rationale for each decision that is made.

In addition, we are ordering in Condition 24 that MNR include in its Annual Report for the Forest Management Unit a summary of disputes over visual resources that could not be resolved in a Plan. A similar summary is ordered in the five-year State of the Forest Report. It is essential that this information be documented to show whether the matters concerning the public are being addressed.

TRAINING AND EDUCATION

MNR witnesses described for us its training and development programs focused on meeting the demands of the timber management planning manual and the various programs involved in timber management (Condition 109). The ministry recently created an Integrated Resource Education and Training Section to handle this work. There are three levels of training, at the provincial, regional and district levels. The identification of areas requiring training will be assisted by the committee system outlined in Appendix 1 of the Conditions of Approval.

We were impressed by the educational program put together by OFIA and MNR for staff, contractors and operators regarding the "good practices" to be followed in riparian areas. We were also impressed by the evidence of Inge Johansson of the Swedish Forest Workers Union on behalf of OPSEU. He described efforts made to educate the forest workers in machine operation, computers and environmental protection to help them carry out their responsibilities. The material is available in different languages (trans: vol. 380, pp. 65817-18). We specify in Appendix 23, section 1(h), that MNR is to expand its current training for woodland workers. We leave to MNR and others involved in timber management the task of determining what subjects exactly should be covered. This education can help the woodworkers in the field play a major role ensuring that timber management activities are carried out in the best way possible.

We believe MNR should also expand its education effort to help give the general public a better understanding of timber management. This project should explain the origins of the boreal forest and the need for disturbance to create new forests, including arguments for and against clearcuts. The use and need for pesticides should also be covered, so that the public will understand the process being approved by the board. Films could be provided to NOTOA, OFAH, environmental groups, educational institutions and public broadcasters. This should not be a slick public relations job, unlike for example Ex. 144, a video in which the voice of God, in condescending tones, tells people why MNR's timber policy is good for them. The educational project should involve some of the parties to this hearing, so that with the different views presented, along with the scientific evidence, people can choose for themselves among the various positions. We order this as Condition 92.

PROGRESS REPORTS

Condition 111, as agreed to by the parties, requires MNR to report its progress on improving implementation manuals, and making advances in information collection and

management, scientific research and technical development and professional and technical training. These reports are to be made to the director of the Environmental Assessment Branch of MOEE.

While these reports will be available to the public, there are no schedules or deadlines for MNR to meet. We are relying more on the Annual Report to the Legislature (Condition 82, Appendix 20) to be a regular check on MNR's progress. For example, some intervenors expressed concerns that once the hearing was completed, MNR might delay in making decisions on such issues as old growth or wetlands in Northern Ontario. In Appendix 20, 1(p), we are ordering MNR to report its progress in these fields to the Legislature each year. Because of our reporting requirements, if MNR procrastinates it will become the subject of public debate. These reports, along with the review ordered in Condition 114, will also make it possible for MOEE to assess progress on these vital concerns when the term of this approval is complete.

CHAPTER 12

THE HEARING PROCESS

This hearing was far too long and far too expensive. In the course of it, we gained what we believe are hard-won insights into why it consumed so much time and cost so much money, and we feel obliged to share our perspective. No one should misunderstand our point; we are not saying that this environmental assessment was not worth the time and expense. On the contrary, we believe this hearing was essential for giving Ontarians a say in determining how timber management planning will be carried out on public lands. More broadly, environmental assessment has established its value in helping the province make better environmental decisions, and nothing we have seen in this hearing makes us question its essential role in giving the public a voice in these matters. But if the hearing process is to thrive in the future, we must learn from our experiences to improve the way things are done.

INADEQUATE PRE-HEARING PREPARATION

The decision to start this hearing in May 1988 – with only a small portion of the proponent's evidence available to the intervenors and the panel, with schedules and plans for community hearings and site visits unsettled and with inadequate staff – was made by the former chair of the board without consultation. It was very ill-conceived and cost much more time than it saved.

When the hearing began, very little preliminary preparation had been done. The proponent, the Ministry of Natural Resources, had submitted witness statements for only four of its 17 panels. Other parties therefore did not know precisely what was in MNR's case, and could not prepare adequately. Eventually, the hearing had to be adjourned from mid-November 1988 to the end of January 1989 to allow MNR to complete its witness statements.

The original estimate of time required for the hearing was nine to 12 months, but this figure may have been drawn from a hat. To our knowledge, it was not based on any planning or pre-hearing consultation. There were preliminary hearings in Toronto, Ottawa, North Bay, Timmins, Sault Ste. Marie, Thunder Bay and Dryden, but all that was really accomplished was identifying who wished to participate. We issued a brief set of procedures that had been used previously in Board hearings, but they proved useless in this case because of the complexity of the issues associated with timber management planning and the logistics of

conducting the hearing across Northern Ontario. Many procedural matters should have been dealt with before the hearing began, such as how much evidence would be presented, how much time was needed for evidence-in-chief and cross-examination, procedures for site visits and community hearings but the Board and the parties were inexperienced and unprepared for a process as massive and complicated as this hearing turned out to be.

The Board itself was inexperienced in long cases and did not have the staff that would have been required to control the process and to help the members cope with the swelling flood of evidence. Eventually, we did attempt to find ways to scope the evidence down to the significant disputes between the parties, but we never were able to achieve the time savings we sought. Instead, hearing time was consumed with settling procedural questions. Even more frustrating, any attempt to change procedures after the first few weeks was opposed vigorously by counsel for most parties, who argued that it would be unfair to change in mid-stream.

In sum, we are convinced that this hearing would have ended sooner if it had started later, after all important preparations were complete.

THE VOLUME OF EVIDENCE

Altogether, the parties submitted more than 60 witness statements ranging in length from 200 to 1,500 pages. Supporting them were hundreds of other exhibits, some of which were documents of 100 pages or more. Lacking expert staff to assist in summarizing the large amount of evidence daily at the hearing, the Board found it difficult to assess when a subject had been covered adequately. Anywhere from two-thirds to three-quarters of the time during MNR's case was taken up by cross-examination, even though hundreds of questions were asked and answered in advance in interrogatories.

A proponent has the right and the responsibility to present its case in a manner to support its application. But we considered the sheer volume of MNR's case to be unacceptable and we are not convinced all the material was relevant for the decision the ministry was seeking. Listening to witnesses for MNR, it was obvious they were fully aware of what the areas of contention and concern were. It would have been helpful and less time-consuming to focus on those areas.

Until ordered by the Board, the ministry did not even provide adequate summaries for its lengthy witness statements. Some of the photocopied articles in the appendices were difficult or impossible to read, and citations to those appendices often failed to identify the pages

in question. As a result, Board members without support from staff knowledgeable in forestry were required to read long documents needlessly. We presume the research staffs of the intervenors also spent significant amounts of preparatory time locating the supporting sections.

Because of the overwhelming volume, we refused to allow the proponent or witnesses for other major parties to read any of their evidence into the record. They could speak to the issues, but never read their testimony. We were astounded, therefore, to learn that a conference on EA "mega-hearings" was told that the timber hearing panel allowed MNR witnesses to read "thousands" of pages into the record. We could not understand why anyone involved in this hearing would make misleading comments about the procedures we followed.

The enormous case presented by MNR put the other parties at a disadvantage. They did not have the resources to match MNR's efforts. We believe this is part of the explanation for the fact that much of the evidence we were presented was many years out-of-date and did not reflect changes in forestry practices which occurred in the late 1970s and the 1980s. We believe the proponent should not have a bottomless pit of money with which to present its case and drag the hearing out, leaving other parties to participate on a shoestring. But it is also true that some intervenors in this case might have been better advised to focus on selected issues of greatest importance to them, rather than try to cover every possible topic.

The intervenors were also put at a disadvantage by what could be characterized as the proponent being a "moving target." Throughout the hearing, but particularly after the change of government in 1990, MNR announced numerous changes to its policies and practices. In a long hearing where the undertaking concerns an ongoing activity such as timber management, change is unavoidable. In our view, a proponent should be encouraged to improve its performance in response to good ideas and issues that are raised, and the public told us MNR was doing this as a result of the scrutiny of the hearing. We acknowledge, however, that the timber management planning application did not remain static during the hearing and this put a strain on the intervenors' resources and ability to respond to changing circumstances in their cases.

ADVERSARIAL TACTICS

This hearing had to cover so much territory that, even if everyone had cooperated fully, it would still have lasted at least two years. But we were distressed that lawyers for the parties refused to go along with any of our efforts to deal with matters efficiently. In our view, the

lawyers seemed more interested in strategies and tactics to fight one another than in concentrating on the evidence. Here are some examples:

- One party brought a motion before us objecting to what counsel for another party said outside of the hearing. We based our decision on the evidence presented in the hearing, not a verbal media war between counsel. The motion in our opinion was frivolous and time-consuming.
- We were requested to do a site visit in the Nipigon area and were prepared to do so. Before our decision was announced, another party requested that we see several other locations in the same area, which would have required only a small amount of extra time. The Board saw this suggestion as helpful. But the party originally requesting the site visit raised objections and then changed its proposal so that the site visit would be part of the evidence-in-chief of a witness. We were not persuaded to change our established practice of refusing to receive or examine evidence during site visits.
- Early in the hearing, we decided OFIA would be granted a limited right to present Reply evidence, so that the forest industry association could respond if there were allegations against its member companies. Eventually, OFIA requested time to present Reply evidence on newly introduced forest equipment which the industry said would mitigate some of the negative harvest effects raised as an issue by other parties. Those parties objected, noting that this evidence was not intended to respond to specific allegations against a company. We rejected the objections, because we could not see what public interest would be served by excluding this evidence. We believe that all the relevant information needed to arrive at a decision beneficial to the province had to be heard.
- An agreement was reached by NAN, OFIA and MNR in September 23, 1991, which was to apply to NAN and the Windigo Tribal Council only. Some eight or nine months after the agreement the Board was contacted by a party seeking an opportunity to appear before the Board on the matter of the agreement among the three parties. This party wanted the right to present further evidence. It wasn't until September 15, 1992, nearly a full year after the agreement, that we received the Notice of Motion and on September 24, 1992, the submissions were heard. The Board heard the matter to insure fairness, but we wonder why it would take a year to file a motion. This agreement was made part of a negotiated partial agreement on terms and conditions signed by all major parties except GCT #3 and OMAA. No party sought to have the agreement applied to other First Nations. If a letter from the proponent in December 1991 caused the concern, why would it take nine more months to file a motion which was heard a week later? We wonder if this was so important, why it would take a year to file a motion?

These and other skirmishes among the lawyers cost significant amounts of time and money, but added nothing helpful to the evidence we had to consider. The only way we were able

to reduce the number of motions was by ordering that motions would be heard only at the conclusion of the day's evidence, starting at 4:30 p.m. We took this step after the panel's previous chairman departed.

After years of these tactics and delays came final argument. On April 17, 1991, the Board gave a direction that written argument was to be submitted by September 15, 1992. At that time, the Board refused a request by the parties to extend the hearing time by two months more. Nevertheless, as the deadline approached some 15 months later, six of the parties in a joint letter to the Board submitted a request to extend the time limit. Had the Board agreed to the extension, the hearing would have continued even longer. As it was, the Board stuck to the schedule, but only two parties submitted written argument on time. One party presented its written material the day we went to Sudbury to commence final oral argument on October 19, 1992. This meant the Board had to digest approximately 2,500 pages of written argument after the hearing ended, thus delaying the decision-making process and the writing of the reasons.

TIME LIMITS

Our experience persuaded us that time limits must be established to ensure that sound decisions are made in a timely fashion while ensuring that public concerns are addressed thoroughly. These time limits must be established before a hearing starts. We proposed time limits during the course of the hearing, but our initiatives were opposed by counsel arguing that it would deny natural justice to impose limits on some parties, when others had already had the advantage of presenting evidence without them. Other efforts to control the length of proceedings only resulted in more procedural wrangling and little good accomplished.

We believe environmental assessment hearings will be held captive by lawyers until the Board is given powers to institute time limits beyond the present regime, which our experience has proved to be inadequate. We believe there is no other solution to making our adversarial, quasi-judicial process work faster and more efficiently without sacrificing fair treatment of all participants. The legal community has demonstrated consistent opposition to time limits but absent this reform, we do not see how shorter hearings will be achieved. We entirely support current initiatives to give the Environmental Assessment Board power by regulation or amendment to legislation to impose time limits on cross-examination. Our experience at this hearing shows that cross-examination accounted for the largest proportion of hearing time. Counsel have relied on the provisions of the *Statutory Powers Procedure Act* to prevent curtailment of cross-examination. It is simplistic to assume

that Board rulings on the relevancy of cross-examination can truncate the process significantly, especially when the evidence concerns a complex subject.

The Environmental Assessment Board has asked the government for authority to set time limits, but so far without success.

INTERVENOR FUNDING AND COSTS

This panel had two serious obstacles to contend with during the hearing. We had neither "costs powers" nor any involvement in the granting of intervenor funding to the parties. Costs powers could have been used to assist the board in expediting the hearing when frivolous motions were introduced or Board orders were ignored. We appreciated that several parties were extremely direct, timely and well prepared in their cross-examination. If we had the power to order costs, however, we certainly would be directing significant costs now.

In a related issue, several parties obtained intervenor funding to produce witness statements which were prepared and submitted to the Board, but never presented as exhibits. We do not believe public funds should be used for fishing expeditions, and if for some reason a party chooses not to rely on the material for which intervenor funding paid, the funds should be repaid.

Intervenor funding for this hearing was controlled by Order-in-Council, because the government refused our request to be included under the *Intervenor Funding Project Act*, 1988. This will not be a problem for future hearings, which will also have the costing powers we lacked.

Ultimately, a total of \$1.83 million was made available under three Orders-in-Council. These funds were portioned out to intervenors by funding panels, according to the criteria of the Orders-in-Council. Many members of the Ontario Federation of Anglers and Hunters (OFAH) and the Northern Ontario Tourist Outfitters Association (NOTOA) complained to us, although we were not involved in the funding decision, of receiving too little intervenor funding for their participation at this hearing. Their complaints were essentially that they had been dealt with unfairly. It seems to us that these persons were not informed by their organizations or the agent representing them at the hearing of the funding panel's reasons, which were released publicly. We are repeating the funding panel's reasons here to clarify any misconception that may exist. OFAH was denied intervenor funding in 1988 because:

The Ontario Federation of Anglers and Hunters has 67,000 members and represents 400 fish and game conservation groups. Although the Federation has a clearly ascertainable interest to be represented at the hearings, it did not establish that it had made a sufficient attempt to fund its participation from its own membership and other sources.

(page 19, Order of the Funding Panel dated February 29, 1988)

In 1989, OFAH was awarded \$45,450 (of which \$44,000 remained unspent as of July 1991) and the funding panel explained why the amount was much smaller than OFAH had requested:

There is no doubt that OFAH is in a position to provide substantial assistance to the hearing board. However, the OFAH proposal has the potential for duplication of funding for the presentation of issues for which funding has been provided to other parties. For example, funding has been allocated to other parties to address the issues of resource planning, the environmental assessment process, wildlife and socio-economics. While it is true that OFAH may bring its own perspective to those issues, where there is potential for overlap, because of limited funds, the panel prefers not to allocate funds and prefers to fund unique areas of interest. In this case, OFAH has a unique interest in the socio-economic impact of MNR's proposal on the special interests of its members and on the wildlife habitat of game species. This is not to say that OFAH does not have an interest in other issues but rather to identify OFAH's interests that are unique to its membership.

(page 27, Order of the Funding Panel dated July 14, 1989)

In addition, the panel stated:

However, the Funding Panel, given the limited funds available, has to compare the applications in the context of need. It is difficult to find that OFAH with its large membership base and its other sources of revenues has a need for assistance that takes precedence over those of native communities in the isolated areas of the undertaking and participating in the Ontario regulatory process for the first time or those intervenors that depend largely on volunteer efforts for their revenues, research and resources.

(page 28, Order of the Funding Panel dated July 14, 1989)

NOTOA was denied funding because the 1987 Order-in-Council directed the funding panel "to consider ... whether the applicant or its members have a direct commercial interest in

the outcome of the hearings." The 1991 Order-in-Council exempted NOTOA from this condition and also excepted OFAH from a condition directing the funding panel to "consider ... whether there is a need, and whether the applicant has tried to raise funds through other means." OFAH and NOTOA joined forces as a Coalition during the hearing, applied for \$396,771 in intervenor funding and were awarded \$127,905.

SITE VISITS AND COMMUNITY HEARINGS

The Board conducted 15 community hearings and four site visits to various parts of the area of the undertaking and in different seasons. The four site visits as explained in Chapter 1 were undertaken so that we could actually see timber management operations and see how various forest conditions influence timber management decisions.

For each site visit planned, the parties were invited to submit to the Board a list of any site or any operation they might want the Board to visit. This could be a harvest operation, a failed regeneration area, the post-harvest "desert" areas we heard of, badly constructed bridges or culverts, damaged spawning areas or moose corridors, for example. When the parties submitted their lists to MNR, they were then given to the Board, usually along with an accompanying map prepared by MNR to indicate the location of each of the requested stops. We decided which operations and sites we wanted to see, based on the statements by the parties of what could be seen at each location. It is incorrect to assume that MNR made these decisions. We made all the decisions about what we would see on the site visits. Helicopters were then provided to take the Board members and representatives from the various parties to the selected locations. Every effort was made in the four site visits to see sites which people suggested might have suffered significant environmental damage.

There is no doubt that following harvest the area looks like a waste land. It's ugly. Several years later, following site preparation and planting or with natural regeneration, the appearance of the site is greatly improved. We were directed by one party to only one serious water crossing problem – a culvert which couldn't handle the water flow. The sediment, in our view, posed a possible risk to a spawning area. It should be noted, however, that this was an exception to what we witnessed. We were encouraged by what we saw and we concluded that much of what the intervenors to the hearing had stated in terms of past operations was no longer occurring. Further we concluded that much more care is being taken by all parties involved in timber management.

We were also encouraged by what we heard at the community hearings. Much of this is described elsewhere in our decision, but the bottom line is that Northerners who live, work

and enjoy in the forests want the type of improvements in harvest, regeneration, maintenance and road construction which have occurred over the past 10 to 15 years to continue after the hearing.

RECOMMENDATIONS

In our view, changes are already needed in the environmental assessment process if it is not to sink into oblivion because of extremely high costs and time.

1. The Ministry of Environment and Energy must, and we understand this is in progress, develop generic guidelines for each type of project. The guideline must spell out clearly the case, conditions and details a proponent must meet in order to get an approval.
2. Once the proponent completes its preliminary documents outlining the undertaking and the measures it intends to use to comply with MOEE's generic guidelines, we believe that intervenors should be invited to become involved long before any decision or approval is even considered. Experienced proponents will consult with the public before the environmental assessment document is finalized.
3. We should consider the possibility of some intervenor funding early in the process. The purpose would be to establish as early as possible the position of the various parties. They would need funding in order to identify clearly any problems which might be met or the objections they have to the proposed project.
4. Once the parties have their positions, priorities or concerns prepared (even if only in preliminary form), the EA Branch of MOEE should commence intensive consultation between the proponent and the public in order to reduce the number of issues in dispute where possible. The more senior and skilled the EA Branch employees are, the better this process will work.
5. If the Minister decides to send the matter to the EA Board, then the Board itself should start a further process of mediation and reduce the matters to be considered by the hearing panel. A Board member should be appointed to further mediate and reduce the issues, with full involvement of all the parties. The various parties at this point would indicate what they consider are the key areas to be presented and heard at the hearing itself. It shouldn't be a case of let parties present anything they want.
6. A case manager from the Board should attend these mediation sessions. This person would be the contact person for all the parties to deal with once the mediation terminates.

7. The case manager would be part of the Environmental Assessment Board's staff who would be assigned to work with the hearing panel. The continuity from any mediation process to a hearing would be essential in expediting a hearing.
8. The hearing panel, before a hearing even starts and in conjunction with the parties, would decide:
 - matters of procedure;
 - time limits for evidence-in-chief for each witness statement for all parties;
 - time limits for cross-examination of all parties by all parties;
 - site visit rules if any;
 - reply and final argument and the time table schedule.

The same rules would apply to parties with counsel or agents, but would be somewhat different for any type of community town hall meeting where people were not represented by counsel or agents. Details to be worked out in advance.

9. It is our recommendation that government amend the *Environmental Assessment Act* to include the ability to set time limits for all phases of the hearing, including cross-examination, because far too much time is taken up here.
10. A formula of putting a cap on the amount a proponent can spend for a hearing must be developed. The amount intervenors would get should be worked into the formula. Fairness and insuring full participation cannot occur the way matters stand now. The intervenor funding legislation should be amended to include such a mechanism. The Act should also spell out clearly that if parties do not use the material for which intervenor funding was received then the funding for that evidence must be reimbursed to the province.
11. As hearings have become more complex, the hearing panels should have professional staff to assist or advise when needed in understanding the material to be presented, particularly when the panel is preparing to hear the case. We believe that with qualified, experienced staff, hearing time can be further reduced, where, for example, the Board might want to end cross examination or in assisting with summaries of evidence. Rules respecting use of expert staff should be developed so that the parties know the role of Board staff.

What we have outlined above is designed not only to expedite hearings, but to ensure the relevant evidence from all parties to the hearing is heard and to reach sound decisions in a timely and cost efficient manner. Many of these ideas have already been presented by the Environmental Assessment Board as recommendations to government in other contexts.

As we said at the outset, the timber management hearing could never have been completed in a few months, no matter how efficiently it was conducted. The subject was just too large and too complex. But this hearing also persuades us that the day has passed when environmental assessment hearings can be conducted solely on an adversarial model using

rules borrowed from the courts. Instead, we have to move into new ways of receiving evidence and having it examined.

DECISION OF THE BOARD

It is the decision of this Board:

- (1) that the Class Environmental Assessment for Timber Management on Crown Lands in Ontario, which includes the evidence presented at the EA hearing, be accepted for the undertaking described herein, pursuant to Section 12 of the *Environmental Assessment Act* (R.S.O. 1990 c. E.18), as amended; and
- (2) that approval be given to proceed with the undertaking described herein, pursuant to Section 12 of the *Environmental Assessment Act* (R.S.O. 1990, c. E.18), as amended, subject to the terms and conditions set out in Schedule "A" attached to this decision and forming part thereof.

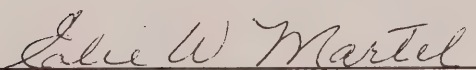
The undertaking for which approval is given in this decision is:

- TIMBER MANAGEMENT PLANNING, comprising the interrelated activities of access, harvest, renewal, maintenance and their planning,
- on Crown lands on which timber management activities are carried out,
- on forest management units, in the area of the undertaking.

Approval of the undertaking permits MNR to use all of the alternative methods of carrying out the undertaking described in the environmental assessment, which includes the evidence presented at the EA hearing, to implement the approved undertaking, subject to the specific directions set out in the terms and conditions of this approval (see Schedule "A").

DATED at TORONTO this 5th DAY of APRIL, 1994.


Mrs. Anne Koven, Chair


Mr. Elie W. Martel, Member

SCHEDULE "A"

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SCHEDULE "A"

TERMS AND CONDITIONS

Timber Management Plans

1. Timber Management Plans, amendments to Timber Management Plans, and Contingency Plans shall be prepared for each forest management unit in Ontario in accordance with the timber management planning requirements described in these terms and conditions.
2. Timber Management Plans shall be prepared in an open consultative fashion by a Registered Professional Forester, who shall be the Plan author assisted by an interdisciplinary planning team and a Local Citizens Committee with opportunities for ongoing participation by interested and affected persons and organizations, and by the general public.

Planning Teams

3.
 - (a) Each Timber Management Plan, each amendment to a Timber Management Plan, and each Contingency Plan shall be prepared by a Registered Professional Forester, who shall be the Plan author, assisted by an interdisciplinary planning team and Local Citizens Committee. Planning teams shall include representatives of the various programs of the Ministry of Natural Resources, including persons with expertise in the areas of timber management, fish and other wildlife biology, lands administration, parks management, fire management, and enforcement. The district manager may assign additional responsibilities to specific planning team members with regard to concerns or interests not represented on the planning team. The Local Citizens Committee will appoint a representative of the committee to serve as a member of the timber management planning team.
 - (b) The district manager will appoint the planning team and identify its members in the Notice of Invitation to Participate.
 - (c) On management units where the Plan is prepared by companies the company shall select the Plan author. The planning team shall in this event include an MNR Registered Professional Forester.
 - (d) When the district manager, in consultation with other government ministries and agencies, identifies matters of specific interest to them which will be addressed in the Timber Management Plan, representatives of those ministries and agencies will be invited to act as advisors to the planning team. This role

is available to any government ministry or agency, including those agencies responsible for native affairs. For Ministry-prepared plans, the district manager may invite representatives from forest companies operating on the forest management unit to act as advisors to the planning team. The Ministry of Environment and Energy may attend planning team meetings as it decides.

- (e) All Timber Management Plans shall contain a list of all planning team members including the Plan author, all planning team advisors and all Plan reviewers, with their job titles and/or affiliations, and a list of all members of the Local Citizens Committee and their affiliations if any.
- (f) The planning team will be chaired by the Plan author.

Advisory Committees and Local Citizens Committee

- 4. (a) The Ministry of Natural Resources shall establish a structure of committees to review, advise, guide and improve the timber management planning process and to increase the level of public input to and public scrutiny of timber management planning in the province.
 - (i) In addition to the public consultation provisions set out in Conditions 8 to 12, a number of local citizens representing a range and balance of interests shall be afforded expanded opportunities to participate in the timber management planning process through membership in a Local Citizens Committee (LCC). MNR shall establish at least one LCC for each district and where needed, one for every management unit in the Area of the Undertaking.
 - (ii) At the regional level, MNR shall establish Regional Advisory Committees (RAC) to provide advice in translating provincial goals into regional objectives. These committees will also scrutinize the progress in achieving management unit, district and regional objectives.
 - (iii) At the provincial level, a Provincial Technical Committee (PTC) shall be established. This committee will review and update technical guidelines, construction/operational manuals, and resource/environmental manuals related to the management of timber and non-timber resources. (See Condition 89).
 - (iv) At the provincial level, a senior level Provincial Policy Committee (PPC) shall be established. This committee will review and provide guidance on provincial resource management goals, objectives, targets and strategies. It will also advise on the development of associated provincial policies to outline the broad goals of other ministries and of the government as a whole.

- (b) The composition and terms of reference of the senior Provincial Policy Committee, the Provincial Technical Committee, the Regional Advisory Committee and the Local Citizens Committee are described in Appendix 1.

Public Notice Requirements for Timber Management

- 5. By January 31 of each year, MNR shall produce a list of all Timber Management Plans currently in preparation and those which are expected to be initiated in that year, including a tentative list of starting dates. The list shall be provided to any person who requests a copy, and shall be available at Ministry of Natural Resources area offices, district offices, regional offices, the office of Operations Integration Branch in Sault Ste. Marie, and MNR's Natural Resources Information Centre, Main Office in Toronto. This list shall also be provided to the regional offices and the Environmental Assessment Branch of the Ministry of Environment and Energy and shall be included in the Annual Report to the Legislature (Condition 82, Appendix 20, section 1(l)).
- 6. Notification of various stages of timber management planning and operations shall be given to the appropriate persons, including interested and affected persons and organizations and the general public. The identification of those persons and organizations is provided in Appendix 2.

Public Consultation in the Preparation of Timber Management Plans

- 7. In addition to the public consultation provisions set out in Conditions 8 to 12, the timber management planning team shall make diligent efforts to ensure ongoing public participation throughout the timber management planning process. As affected members of the public are identified, the planning team shall make reasonable efforts to communicate with those persons to solicit their input into the timber management planning process and to facilitate contact between them and the Local Citizens Committee. In addition, members of the public shall be afforded the opportunity to arrange for meetings with representatives of the planning team and the Local Citizens Committee at any time during the timber management planning process. Reasonable opportunities to meet planning team members during non-business hours shall be afforded.
- 8.
 - (a) Formal public consultation opportunities shall be provided at four stages in the timber management planning process for each Timber Management Plan, as set out in Conditions 9 to 12. These opportunities include an option for native communities to choose additional consultation and documentation opportunities, which is referred to in these terms and conditions as the Timber Management Native Consultation Program (i.e. Conditions 10(b)(i) and 11(b)(i) and Appendix 10). [SEE FIGURE 1]
 - (b) Public Notices shall be issued at each stage of the public consultation process. The timing and contents of the Public Notices are set out in Appendix 3.

Details of the minimum information available at each stage of the public consultation process are set out in Appendix 4.

9. (a) Stage One of the public consultation process shall commence with the issuance of an Invitation to Participate. This Notice shall be issued before any proposals for operations have been developed, and shall list the information available at this stage of the process, and provide direction on how to obtain access to this information. The purpose of this public consultation opportunity is to advise the public that timber management planning is commencing for the forest management unit; to provide access to information to be used in the timber management planning process; and to request contributions to the background information base to be used in timber management planning.
- (b) At the time of issuance of the Invitation to Participate, a separate Invitation to Participate and a Notice of Community Meeting shall be issued to each native community in or adjacent to the forest management unit. The purpose of this consultation opportunity is to review and solicit comments on the draft Native Background Information Report (described in Condition 19); to determine whether additional information is required and to arrange for its collection; and to provide an opportunity for the native community to choose between the standard public consultation provisions of the timber management planning process and the Timber Management Native Consultation Program.
10. (a) Stage Two of the public consultation process shall commence with the issuance of the Notice of the First Information Centre. This Information Centre shall be held during development of proposals for the Timber Management Plan, before decisions are made concerning timber management operations. The purpose of this public consultation opportunity is to provide a formal opportunity for public comment on the assembly and analysis of background information and the evaluation of alternatives; to generate additional alternatives for consideration; and to request additional contributions to the information base and other information to be considered in decision-making. A Preliminary Plan Summary shall be made available and distributed. It is described in Appendix 4, part A, section 2(a).
- (b) (i) Timber Management Native Consultation Program: In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, at the time of issuance of the Notice of the First Information Centre, a Preliminary Report on Protection of Identified Native Values (described in Condition 57) shall be provided to the native community. A Notice shall be issued to the native community advising of the agreed forum for consideration of the Report. The purpose of this stage of consultation is for the community to comment on the Report and all other analysis of background information and the evaluation of alternatives for the plan; to generate additional alternatives for consideration; and to provide information on the native communities' preferred alternatives;

- (ii) Where a native community has chosen to participate in the standard public consultation process, MNR shall, with whatever modifications are necessary, arrange a special Information Centre at a location convenient to that community, upon request.
- 11.
 - (a) Stage Three of the public consultation process shall commence with the issuance of a Notice of Draft Plan Review and Notice of the Second Information Centre. This Information Centre shall be held upon completion of the draft Timber Management Plan and MNR's preliminary review of that draft Timber Management Plan. The purpose of this public consultation opportunity is to provide a formal opportunity for public review of, and comment on, the proposed operations before MNR finalizes its review of the draft Timber Management Plan. A Draft Plan Summary shall be made available and distributed. It is described Condition 58, Appendix 11 and Appendix 4, part A, section 3(a)(iv).
 - (b)
 - (i) Timber Management Native Consultation Program: In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, at the time of issuance of the Notice of Draft Plan Review and Notice of the Second Information Centre, a Final Report on Protection of Identified Native Values (described in Condition 57) shall be provided to the native community. A Notice shall be issued to the native community advising of the agreed forum for consideration of the Report. The purpose of this stage of consultation is for the community to comment on the Report before MNR finalizes its review of the draft Timber Management Plan.
 - (ii) Where a native community has chosen to participate in the standard public consultation process, MNR shall, with whatever modifications are necessary, arrange a special Information Centre at a location convenient to that community, upon request.
- 12. Stage Four of the public consultation process shall commence with the issuance of a Notice of Plan Inspection. This Notice shall be issued upon MNR approval of the Timber Management Plan. The purpose of this public consultation opportunity is to advise the public that timber management planning has been completed for the forest management unit, and to provide a formal opportunity for the public to examine the results of the planning process. An Approved Plan Summary shall be made available and distributed. It is described in Condition 58 and Appendix 11.
- 13. MNR shall provide various maps to assist public understanding of timber management planning. All such maps shall be adequate for the purpose of showing the locations of past and planned operations. These Maps shall be easy to read and their format shall be standardized across the Area of the Undertaking.
 - (a) Public consultation: (Stage One) Invitation To Participate the following maps shall be provided:

- (i) a map of a Forest Management Unit pursuant to the requirements of Appendix 3, part A, section 1(a)(ii), Appendix 3, part C, section 1(b) and Appendix 11, section 1(a);
 - (ii) a values map pursuant to the requirements of Condition 17 and Appendix 5;
 - (iii) a native values map pursuant to the requirements of Appendix 6, section 1(c) and Appendix 10, section 1(b);
 - (iv) a 20-year eligibility map, including primary road corridors pursuant to the requirements of Conditions 29 and 30 and Appendix 4, part A, section 1(b)(v);
- (b) Public consultation: (Stage Two) First Information Centre, as well as the maps from (a), the following maps shall also be provided:
 - (i) a five-year preliminary "areas selected for operations map" pursuant to the requirements of Conditions 35 and 40(b);
 - (ii) a mapped summary of past and proposed harvest operations and alternative road corridors, pursuant to Condition 18;
 - (iii) a mapped summary of ranked areas proposed for harvest for the five-year term of the Timber Management Plan pursuant to Condition 34.
 - (iv) a mapped summary of the proposed areas of operations and alternative road corridors pursuant to Appendix 3, part A, section 2(a)(v) and Appendix 4, part A, section 2(k).
- (c) Public consultation: (Stage 3, Draft Plan) Second Information Centre, the following maps shall be provided:
 - (i) a mapped summary of the operations planned at the draft Plan stage for the five-year term of the Timber Management Plan pursuant to the requirements of Condition 58 and Appendix 11, section 2; and,
 - (ii) a map of areas eligible for insect pest management pursuant to Condition 69, Appendix 14 and Appendix 4, part B, section 2(a)(ii).
- (d) There shall also be provided the following maps (Stage Four, Approved Plan Inspection):
 - (i) a mapped summary of the operations planned for the five-year term of the approved Timber Management Plan pursuant to the requirements of Condition 58 and Appendix 11, section 2.

14. MNR shall respond in writing, in a responsive and timely way, to all written comments and submissions received from any person or group during the preparation of a Timber Management Plan. This requirement shall also apply to all verbal comments if a written response has been requested. In those responses, MNR shall provide an explanation of the results of the consideration of the comments and submissions.

Background Information

Natural Resources:

15. Forest Resource Inventory data shall be available for each forest management unit for use in timber management planning and shall be updated by using:
 - (a) the results of the renewal and tending activities for both naturally and artificially regenerated areas in the form of Free-to-Grow Assessments conducted during the previous five-year term; and
 - (b) depletion information, in the form of harvest data and data concerning natural depletions which occurred during the previous five-year term.
16. Fisheries and wild life inventory information shall be available for each forest management unit for use in timber management planning, and shall include:
 - (a) information concerning fish species present, critical fish habitats (e.g. spawning areas), and the slope of shoreland areas;
 - (b) information about sites of occurrence of, and/or high value habitat for, threatened and endangered flora and fauna;
 - (c) information about sites of occurrence of rare flora and fauna;
 - (d) information about areas of present or future value as habitat for moose, deer or caribou, including:
 - (i) an assessment of production capability for moose or caribou; or
 - (ii) an assessment of habitat suitability for deer; and
 - (e) information about sites of occurrence of, and/or areas of present or future high value as habitat for, flora and fauna of local concern.

Values Map:

17. (a) For each Timber Management Plan, MNR shall produce a values map (or series of maps) for the forest management unit. The values map is a representation in summary form of the geographical location of the known natural resource features, land uses and values which must be considered in timber management planning, and about which further inventory information is available. The values map is intended to be used primarily for planning purposes, and will also be used to display available information, and to solicit information about natural resource features, land uses and values which may not have been previously identified. The types of information normally portrayed on the values map (or maps) are listed in Appendix 5, part B.
- (b) The values map (or maps) will be continuously updated during the preparation and implementation of the Timber Management Plan, as information is assembled.
- (c) The values map (or maps) will be available on request from the appropriate MNR district office. The detailed background information for the forest management unit, which is summarized on the values map (or maps), will be maintained at the appropriate district office and be made available on request to any person, except in those cases where publication of the information may be detrimental to the conservation of particular values.
- (d) The values map (or maps) shall be prepared at a suitable scale to allow for appropriate resolution of information and for ease of reproduction, and all values maps will use standard symbols for commonly mapped items.

Operations Map: Proposed and Past Harvest Operations:

18. MNR shall produce a "proposed and past harvest operations map" for each forest management unit, at a scale appropriate to portray information about the locations of past, proposed and/or approved harvest operations for the two past five-year Timber Management Plans, the Plan currently in force and the proposed Plan. This map shall also show alternative road corridors for each forest management unit. This map shall be in summary form for the public to take home and will be made available at the First Information Centre.

Native Background Information Report:

19. MNR and the native communities in or adjacent to the forest management unit (in conjunction with the company's Plan author, where appropriate) shall produce a Native Background Information Report for use in timber management planning. The information to be contained in this Report is listed in Appendix 6.

Implementation Manuals for Timber Management:

20. (a) MNR's approved implementation manuals, as updated in accordance with Condition 93, shall be used in the planning and implementation of timber management activities. These implementation manuals include provincial guidelines and construction/operational manuals, the use of which is mandatory in timber management. The implementation manuals also include resource/environmental manuals, which are used in the development of timber management strategies and prescriptions for the specific values addressed in those manuals when those values are at risk or are featured for management on the forest management unit.
- (b) Implementation manuals are listed in Appendix 7.

Contents of a Timber Management Plan

Report of Past Forest Operations:

21. (a) Each Timber Management Plan shall contain a Report of Past Forest Operations, which reports on operations carried out during the five-year term of the previous Plan. The contents of the Report of Past Forest Operations and its analysis of meeting objectives, targets and strategies are listed in Appendix 8.
- (b) The Plan author shall prepare a summary that provides an analysis of past operations and the results of the independent audit. The summary will highlight problems, issues and various objectives for access, harvest, renewal and maintenance as well as the proposed strategies to achieve each objective.

Timber Management Objectives and Strategies, Problems and Issues:

22. (a) Each Timber Management Plan shall contain clear statements of timber management objectives developed during timber management planning and a discussion of the related problems and issues which are considered in the Plan. Strategies which address the objectives, problems and issues will be described in the Plan.
- (b) Each Plan shall provide measurable and quantifiable objectives for timber production objectives detailing annual levels of production for each of the five years covered by the Plan, for the five-year Plan in total and where possible, for the remaining five year increments of the 20-year planning horizon. These figures shall be broken down by hardwood, conifer and tree species.
- (c) Each Plan shall discuss whether insect pest infestations are likely to be a problem during the term of the Plan and whether insect pest management

planning is anticipated. Each Plan will describe management strategies for meeting the problem.

Non-timber Values: Strategies, Problems and Issues:

23. (a) Each Timber Management Plan shall identify the management objectives for non-timber values which exist in other plans or policies, and which could be affected by timber management activities to be carried out under the Plan. Problems and issues with respect to those objectives which are related to timber management activities will be described. Timber management strategies intended to assist in meeting those non-timber objectives which involve the manipulation of forest cover will be described in the Plan.
- (b) The specific sources of the existing objectives (e.g. District Land Use Guidelines, resource management plans, government agreements with native people) shall be stated, and the geographic area for which those objectives have been developed shall be identified.
- (c) Where management objectives for non-timber values are not identified in other plans or policies and such non-timber values can reasonably be dealt with in a Timber Management Plan through manipulation of forest cover, Timber Management Plans may determine management objectives for them.

Visual Resources:

24. Timber Management Plans shall contain a section on Visual Resource Management where the Plan author will report the status of complaints about visual impacts and the rationale for the prescription made to address the complaint. Disputes over visual resources that remain unresolved shall be summarized in the Annual Report for the Forest Management Unit pursuant to Condition 79 and Appendix 18, section 1(n), and in the five-year State of the Forest Report pursuant to Condition 84 and Appendix 22, section 1(l).

Silvicultural Ground Rules:

25. (a) Each Timber Management Plan shall contain Silvicultural Ground Rules developed for the forest management unit by a Registered Professional Forester.
- (b) Pending completion of the revision of MNR's silvicultural guides (described in Condition 94(a)), the site types contained in the Silvicultural Ground Rules for the forest management unit shall be developed using the current silvicultural guides, and the relevant Forest Ecosystem Classification System, and the best available site information.

- (c) Upon completion of the revision of MNR's silvicultural guides (described in Condition 94(a)), the general standard site types provided in MNR's silvicultural guides shall be used in the development of the Silvicultural Ground Rules. The Silvicultural Ground Rules which are developed for each forest management unit will be cross-referenced to the general standard site types provided in the silvicultural guides.
26. (a) The table identifying Silvicultural Ground Rules shall include a description, by site type, of:
- (i) the preferred silvicultural treatment package including silvicultural system, logging method, site preparation, regeneration and tending treatments and acceptable alternative silvicultural treatment packages; and
 - (ii) regeneration stocking standards.
- (b) Where a silvicultural treatment included in the Silvicultural Ground Rules is not in accordance with recommendations included in the appropriate silvicultural guide, the treatment shall be recorded in the Timber Management Plan as an "exception." The reasons for that treatment shall be provided.

Clearcuts:

27. MNR shall implement a restriction on clearcut harvesting requiring a range of sizes of clearcuts not to exceed 260 hectares. MNR shall also develop standards for configuration and contiguity of clearcuts which will ensure that the purpose of this restriction is not frustrated.
- (a) These restrictions and standards shall be incorporated into the Environmental Guidelines for Timber Management Activities specified in Condition 94(b).
 - (b) Silvicultural Ground Rules shall be prepared with the objective of ensuring that clearcuts are planned to a range of sizes and not consistently approach or meet the permitted maximum. Where for sound biological or silvicultural reasons individual or contiguous clearcuts exceed 260 hectares, they shall be recorded in the Plan as an exception to this condition, with reasons provided.
 - (c) MNR shall inventory and monitor clearcuts and exceptions to the maximum size restriction as well as configuration and contiguity. The results shall be in the Annual Report for the Forest Management Unit, in the Annual Report to the Legislature, in the five-year State of the Forest Report and in the review for the Minister of Environment and Energy pursuant to Condition 114 (a)(v).

Maximum Allowable Depletion:

28. Each Timber Management Plan shall contain the calculation of Maximum Allowable Depletion for each forest unit or working group. The methodology for the calculations shall be described, and the results of the calculations shall be portrayed graphically. The rationales for the chosen Maximum Allowable Depletions shall be provided. At a minimum, calculations shall be performed for the entire rotation period for each forest unit or working group.

Eligibility and Eligibility Criteria (Twenty-year Plan Period):

29. (a) Each Timber Management Plan shall contain criteria for the identification of areas eligible for harvest, renewal and tending operations for the 20-year period of the Plan. Those areas in the forest management unit which meet the eligibility criteria shall be portrayed on "eligibility maps" in the Timber Management Plan, and an explanation of how the application of the eligibility criteria resulted in the areas eligible for operations shall be provided.
- (b) Where the area of the forest management unit meeting eligibility criteria is considerably in excess of the anticipated requirements for the 20-year period of the Plan, a "projected operating area" where those operations are most likely to take place during the 20-year period may be identified. Where the option of a "projected operating area" is used in the preparation of a Timber Management Plan, the rationale for the selection of the area shall be provided.

Primary Access Corridors (Twenty-year Plan Period):

30. (a) Each Timber Management Plan shall contain the selected corridor for each new primary road which will be required to provide access to and within areas eligible for operations (or the projected operating areas) for the 20-year period of the Timber Management Plan.
- (b) The selected primary road corridors shall be clearly identified on the "eligibility maps" in the Timber Management Plan.
31. (a) For each new primary road, there shall be documentation of the reasons that a primary road is required and consideration of a reasonable range of practical alternative one-kilometre-wide corridors.
- (b) In identifying a reasonable range of practical alternatives for evaluation, there shall be consideration and documentation of the following factors:
- (i) the degree to which the physical conditions present in the area act as constraints or provide opportunities;

- (ii) the degree to which non-timber values present in the area act as constraints or provide opportunities, including possibilities for development of other resources;
 - (iii) any significant engineering or safety factors; and
 - (iv) any other planning processes dealing with access in the area, including but not limited to planning of hydro transmission and pipeline corridors, access to hydro-electric generating sites, establishment of potential cottage and recreation areas.
32. (a) For each corridor identified in accordance with Condition 31(b), there shall be an evaluation of the following parameters which shall be documented:
- (i) an assessment of the advantages and disadvantages of that alternative for timber management purposes, in providing access to and within areas eligible for harvest, renewal and tending operations for the 20-year period of the Plan;
 - (ii) an assessment of the advantages and disadvantages of that alternative as they relate to potential effects on non-timber values;
 - (iii) consideration of reasonable use management strategies; factors to be considered include public access provisions or restrictions, and maintenance provisions and, where appropriate, abandonment provisions; and
 - (iv) an estimate of costs related to road construction and use management, including a projection of maintenance costs and, where appropriate, abandonment costs.
- (b) The selection of a corridor from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the corridor and associated use management strategy shall be provided.
33. Whenever a new river/lake drive is proposed, or an existing river/lake drive is proposed to be extended, for the purposes of access for timber management, the proposal shall be considered in the timber management planning process as a primary access option, and the planning requirements for primary access shall apply.

Harvest, Renewal and Tending Operations and Selection Criteria (Five-Year Plan Term):

34. At the First Information Centre MNR shall provide a map depicting those areas meeting the selection criteria for harvest during the five-year term of the Plan. This map shall indicate preference by rank of those areas proposed for harvest and the

reasons for the ranking accorded. This map shall be in summary form for the public to take home.

35. Each Timber Management Plan shall contain criteria for the selection of areas for harvest, renewal and tending operations for the five-year term of the Plan. Those areas in the forest management unit within the areas eligible for operations which meet the selection criteria shall be portrayed on "areas selected for operations maps" in the Timber Management Plan. For harvest operations, areas will be selected up to the level of the Maximum Allowable Depletion. An explanation of how the application of the selection criteria resulted in the areas selected for harvest, renewal and tending operations shall be provided.
36. Each Timber Management Plan shall contain a forecast of the level of timber harvest activity expected to be carried out during the five-year term of the Plan. This estimate shall be based on past and projected industrial wood requirements. The area selected for harvest which is surplus to the estimated level of harvest shall be identified on the "areas selected for operations maps" as "surplus area."
37. The Plan author shall describe the size of the area planned for harvest operations and the size of the area planned for harvest required for the reason of insect pest management including accelerated harvest operations, redirected harvest operations and salvage operations. The Plan author shall also describe, by species, the extent to which these harvest activities will mitigate or prevent damage to timber and the impact these harvest activities will have on the extent of spray operations.
38.
 - (a) Each Timber Management Plan shall contain a forecast of the level of activity for tending and renewal operations (e.g. site preparation, planting, seeding, natural regeneration and tree improvement support) planned to be carried out during the five-year term of the Plan, and an estimate of the amount of spending required to achieve the regeneration goals.
 - (b) Each Timber Management Plan shall contain an estimate of the area of planned harvest which is expected to regenerate to commercial species within a prescribed time period (i.e. years to Free to Grow) as specified in the Maximum Allowable Depletion calculation, whether by artificial or natural regeneration methods. A discussion shall also be provided concerning the relationship between the area of planned harvest and the area expected to regenerate to commercial species within that prescribed time period.
 - (c) Each Timber Management Plan shall contain a discussion concerning any significant differences between the planned level of renewal and tending activity and the level necessary to achieve the timber management objectives for the forest management unit, and the potential implications of those differences for long-term wood supply.
39. In addition to the areas selected for harvest, renewal and tending operations for the five-year term, each Timber Management Plan shall identify a contingency area. This area will be available for operations in the event that circumstances arise causing the

areas selected for operations to be no longer available. The contingency area must meet the criteria for the selection of areas for harvest, renewal and tending operations, and therefore shall fall within the previously identified eligible areas. The contingency area shall be identified separately on the "areas selected for operations maps."

40. (a) The locations where the various site types described in the Silvicultural Ground Rules are likely to be encountered within the areas of operations for the five-year term of the Timber Management Plan shall be recorded on the "areas selected for operations maps."

This information will represent the best estimate of the site conditions that are likely to be encountered, based on available information at the time of Plan preparation, and will not limit the selection of any other approved alternative silvicultural treatments (contained in the Silvicultural Ground Rules) in the event that the actual site conditions encountered are found to be different at the time of implementation of operations.

- (b) The locations where the following silvicultural treatments of special public interest are likely to occur during the five-year term of the Timber Management Plan shall be portrayed on the "areas selected for operations maps":

- (i) candidate prescribed burns,
- (ii) aerial application of herbicides,
- (iii) areas eligible for insect pest management and areas proposed for spray projects, and
- (iv) locations where there is a likelihood of merchantable and unmerchantable timber being left on site after harvest, the reasons for this and plans for its disposition.

This information will represent the best estimate of proposed operations at the time of Plan preparation, and will not limit the selection of any other approved alternative silvicultural treatments (contained in the Silvicultural Ground Rules) at the time of implementation of operations.

Area of Concern Prescriptions:

41. (a) Each Timber Management Plan shall contain specific prescriptions for individual Areas of Concern, or groups of Areas of Concern having common values, which may be affected by timber management activities within the areas selected for operations during the five-year term of the Timber Management Plan.

- (b) The selected prescription for each Area of Concern, or group of Areas of Concern having common values, shall be listed in the Timber Management Plan and, where practical, shall be portrayed on the "areas selected for operations maps" in the Timber Management Plan.
- 42. For each Area of Concern or group of Areas of Concern having common values, there shall be consideration of a reasonable range of practical alternative prescriptions. Alternative prescriptions may include reserves, modified operations or normal operations, individually or in combination. In identifying a reasonable range of practical alternatives for evaluation, the following principles shall apply:
 - (a)
 - (i) where an implementation manual provides specific direction as to the appropriate prescription to be used in specific circumstances, that prescription may be selected without additional consideration of alternative prescriptions;
 - (ii) in all such cases, documentation of the specific prescription and the identification of the appropriate section of the implementation manual shall be provided;
 - (b)
 - (i) where an implementation manual provides recommendations for prescriptions when particular conditions are encountered, and both the local conditions and the selected prescription are in accordance with the implementation manual, additional consideration of alternative prescriptions is not required;
 - (ii) in all such cases, the specific conditions encountered, the reasons for determining that the prescription is reasonable in the particular local circumstances, the specific prescription and the identification of the appropriate section of the implementation manual shall be provided;
 - (c) where it is determined that the specific direction or recommendations referred to in Conditions 42(a) and 42(b) may not be appropriate to the local circumstances: additional alternative prescriptions shall be identified; the requirements of Condition 43 shall apply; and the selected prescription (where it differs from the specific direction or recommendations) shall be recorded in the Timber Management Plan as an "exception."
- 43.
 - (a) Where alternative prescriptions are identified in accordance with Condition 42, there shall be an evaluation of the following parameters for each alternative which shall be documented:
 - (i) identification of the potential environmental effects of specific timber management activities on the value(s) present in the Area of Concern; and

- (ii) an assessment of the advantages and disadvantages of that alternative prescription in preventing, minimizing or mitigating the potential effects on the value(s) present in the Area of Concern.
 - (b) The selection of a prescription from among the alternatives shall be based on a comparison of the evaluations of the alternative prescriptions. The reasons for the selection of the prescription shall be provided.
44. Where an implementation manual requires consultation with directly affected parties in the development of specific prescriptions, the Timber Management Plan shall record instances where those parties do not concur with the selected prescription, with the reasons for their non-concurrence where available.

Fuel Wood:

45. Timber Management Plans shall provide for maximum utilization of unmerchantable and unmarketable timber including timber left on the ground in piles or still standing following harvest operations, for fuel wood. MNR shall provide advertised notice of locations where fuel wood can be found.

Primary and Secondary Road Locations (Five-Year Plan Term):

46. (a) Each Timber Management Plan shall contain the location of each new primary and secondary road which is required during the five-year term of the Timber Management Plan.
- (b) The selected locations of all primary and secondary roads for the five-year term shall be clearly identified on the "areas selected for operations maps" in the Timber Management Plan.
47. For each primary road corridor selected in accordance with Condition 32, the corridor required for the five-year term of the Timber Management Plan shall be refined to a 500-metre wide road corridor. A specific location shall also be determined in each Area of Concern traversed by the corridor, in accordance with Conditions 51 and 52.
48. (a) For each new secondary road, there shall be documentation of the reasons that a secondary road is required, and consideration of a reasonable range of practical alternative 500 metre-wide corridors.
- (b) In identifying a reasonable range of practical alternatives for evaluation, the requirements of Condition 31(b) shall apply.
49. (a) For each corridor identified in accordance with Condition 48(b), there shall be an evaluation of the following parameters which shall be documented:

- (i) an assessment of the advantages and disadvantages of that alternative for timber management purposes, in providing access to and within areas selected for harvest, renewal and tending operations for the five-year term of the Plan;
 - (ii) an assessment of the advantages and disadvantages of that alternative as they relate to potential effects on non-timber values;
 - (iii) consideration of reasonable use management strategies; factors to be considered include public access provisions or restrictions, and maintenance provisions and, where appropriate, abandonment provisions; and
 - (iv) an estimate of costs related to road construction and use management, including a projection of maintenance costs and, where appropriate, abandonment costs.
 - (b) The selection of a corridor from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the corridor and associated use management strategy shall be provided.
 - (c) Where the preferred use management strategy will require the restriction of public access on primary and secondary roads, the Timber Management Plan shall state why.
 - (d) For each secondary road corridor selected in accordance with Condition 49(b), a specific road location shall also be determined in each Area of Concern traversed by the corridor, in accordance with Condition 52.
50. In the planning of primary and secondary road corridors, where alternative corridors will create access to remote native communities not previously accessible by road, or will result in an increase in the accessibility of such communities, the analysis shall include an assessment of the advantages and disadvantages to the remote communities of the change in accessibility. The assessment shall include input from the specific communities.

Primary and Secondary Road Locations in Areas of Concern:

51. (a) In each case where a primary or secondary road corridor selected in accordance with Conditions 32 or 49 traverses an Area of Concern, there shall be consideration of a reasonable range of practical alternative 100 metre-wide road locations in the Area of Concern.
- (b) In identifying a reasonable range of practical alternatives for evaluation, the requirements of Condition 31(b) shall apply.

52. (a) For each road location identified in accordance with Condition 51(b) there shall be an evaluation of the following parameters, which shall be documented:
- (i) identification of the potential environmental effects on the value(s) present in the Area of Concern; and
 - (ii) identification of potential preventive and mitigative measures.
- (b) The selection of the road location from among the alternatives shall be based on a comparison of the evaluations of the alternatives. The reasons for the selection of the road location shall be provided.
- (c) The selected road location in the Area of Concern shall be clearly identified on the "areas selected for operations maps" in the Timber Management Plan.
- (d) Where it has been determined that the primary or secondary road which traverses the Area of Concern is likely to be abandoned, if there is a water crossing in the Area of Concern there shall be a determination as to whether the water crossing is likely to require removal. That determination shall be based on biological, engineering, water quality and safety criteria. Relevant information to be considered at the time of issuance of construction approvals and work permits shall be provided in the Timber Management Plan.
- (e) MNR shall form a committee of technical experts with the MOEE and the Industry in order to develop the biological, engineering, water quality and safety criteria referred to in Condition 52(d). These criteria shall be developed within two years of this approval.

Tertiary Roads Restrictions/Conditions:

53. Where tertiary roads may be constructed in areas associated with, or in proximity to, values identified on the values map, any necessary conditions on the locations, construction or use management (including water crossing removal) of those tertiary roads shall be determined. These conditions shall be documented in the Timber Management Plan and may also be portrayed on the maps of the areas selected for operations for the five-year term of the Plan. In appropriate circumstances, such conditions may involve marking or flagging of tertiary road locations prior to implementation of operations, and/or notification in advance to directly affected parties to provide an opportunity for verification of road locations in conformity with the conditions specified in the Timber Management Plan.

Flagging:

54. MNR shall ensure that the location of access road corridors and locations, landings, water crossings, reserves, buffers, and harvest blocks, shall be accurately mapped and clearly flagged. Such flagging shall occur before the commencement of timber

management operations, and shall be routinely monitored by MNR during and after these operations to ensure compliance with the flagging and other prescriptions and operational restrictions.

Monitoring Provisions in Timber Management Plans:

55. (a) Each Timber Management Plan shall contain a discussion of the following monitoring provisions:
- (i) a general description of the "area inspection program" (see Condition 78) for that forest management unit, and specific provisions for monitoring operations in individual Areas of Concern or groups of Areas of Concern having common values;
 - (ii) specific provisions for monitoring the effectiveness of any silvicultural treatments which are "exceptions" to the recommendations in the silvicultural guides, as described in Condition 26(b);
 - (iii) specific provisions for monitoring the effectiveness of any prescriptions which are "exceptions" to the recommendations in any other implementation manual, as described in Condition 42(c); and
 - (iv) the program for carrying out Free-to-Grow Assessments for both naturally and artificially regenerated areas on that forest management unit.
- (b) The monitoring provisions shall address the methods to be used, the timeframe for monitoring, and reporting requirements.

Supplementary Documentation:

56. Each Timber Management Plan shall contain supplementary documentation which describes the information used and developed in planning. The contents of the supplementary documentation are listed in Appendix 9.

Report on Protection of Identified Native Values:

57. In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, during the development of the Timber Management Plan the timber management planning team shall produce a Report on Protection of Identified Native Values. The contents of the Report are listed in Appendix 10.

Timber Management Plan Summaries:

58. A summary of each draft and approved Timber Management Plan shall be produced and shall be available for distribution to the general public upon request. The summary documentation shall be produced in both written and mapped format. The contents of the Timber Management Plan summaries are listed in Appendix 11.
59. Each Timber Management Plan shall contain an Index to the environmental assessment components of the Timber Management Plan. The Index shall reference the location of the following information in the Timber Management Plan:
 - (a) background information;
 - (b) a description of the environment to be affected;
 - (c) a description of the process for selecting operations and the alternatives which were considered;
 - (d) a description of the proposed activities;
 - (e) a description of the expected effects on the environment and proposed mitigation measures and monitoring;
 - (f) a description of the public consultation process and a summary of the results; and
 - (g) any other environmental assessment matters addressed in the Timber Management Plan.

Other Timber Management Planning and Operational Matters

Plan Review and Approval:

60. Each Timber Management Plan, amendment to a Timber Management Plan, and Contingency Plan shall be prepared by a Registered Professional Forester who shall be the Plan author, and will be so certified in accordance with the *Crown Timber Act*, R.S.O. 1990, c. C.51.
61. Each Timber Management Plan, amendment to a Timber Management Plan, and Contingency Plan shall be recommended for approval by the appropriate district manager. In making this recommendation, the district manager shall certify that:
 - (a) the Plan has been prepared in accordance with this approval and with the requirements of the Timber Management Planning Manual for Crown Lands in Ontario, as amended in accordance with Condition 90;

- (b) relevant policies and other obligations have been considered, including integrated resource management policy, and general government policies and obligations related to native people and any agreements with native people specific to the management unit;
 - (c) the Plan has been prepared in accordance with the appropriate implementation manuals. In the event that the Plan contains prescriptions which differ from specific direction as to the appropriate prescription or with recommendations in the applicable implementation manuals, the specific section of the Plan which provides documentation of the "exception" and the reasons for the "exception" shall be referenced in the district manager's Certification.
- 62.
 - (a) Each draft Timber Management Plan shall be reviewed by the district office, and the appropriate regional office for compliance with this approval, with the Timber Management Planning Manual for Crown Lands in Ontario as amended in accordance with Condition 90 and with relevant government policies and other obligations as described in Condition 61(b).
 - (b) Upon completion of this review, the MNR shall produce a preliminary list of required alterations and the reasons for the required alterations.
 - (i) The district manager shall consider and resolve any remaining disagreements among planning team members.
 - (ii) Required alterations relating to manipulation of the forest cover shall be certified by a Registered Professional Forester.
 - (c) The draft Timber Management Plan accompanied by the preliminary list of required alterations shall be subject to public review, as described in Stage Three of the public consultation process. After the completion of that public review, MNR shall consider the comments received, and produce a final list of required alterations.
 - (d)
 - (i) The final list of required alterations shall be provided to the Plan author, the Local Citizens Committee, any person who has requested a change in the draft Plan, and any other person known to be directly affected by the manner in which a requested change has been addressed.
 - (ii) The final list shall be accompanied by a request to any person who wishes a formal review of a specific Timber Management Plan decision, to notify the regional director as soon as possible.
 - (e) Where a person has requested a formal review by the regional director any other person known to be directly affected by the request shall be notified that formal review of a specific Timber Management Plan decision has been requested. In conducting his review, the regional director shall also solicit and consider the views of the Local Citizens Committee, the Plan author and the district manager.

- (f) The regional director shall provide a written decision with reasons to the affected parties and to the Local Citizens Committee.
 - (g) The documentation produced in the review shall be included in the supplementary documentation which accompanies the approved Timber Management Plan, and in the event of a bump-up request concerning that issue, shall form part of any record produced by MNR to the Ministry of Environment and Energy.
 - (h) The regional director shall complete any such review before MNR approval of the Plan.
63. Upon satisfactory completion of the required alterations to the draft Plan, the revised Timber Management Plan shall be approved by the regional director, and the Notice of Plan Inspection shall be issued.

Issue Resolution Process:

64. Where there is an issue during the preparation of a Timber Management Plan, plan amendment, insect pest management program, or a bump-up request, any person concerned about the issue shall follow this issue resolution procedure in order to ensure that the issue is dealt with fairly, fully and promptly.
- (a) The concerned person shall tell the Plan author about the issue, preferably in writing, and offer a proposed solution.
 - (b) The Plan author shall meet with the person in order to resolve the issue. A resolution to the concern shall be appropriately recorded pursuant to the Area of Concern process (Conditions 41 to 44) or in supplementary documentation to the Plan (Appendix 9, section 1(h)). If these discussions do not produce a resolution, the Plan author shall communicate the issue in writing to the MNR district manager and to the Local Citizens Committee.
 - (c) The district manager shall arrange and attend a meeting of the Plan author, the concerned person and one or more members of the Local Citizens Committee in order to seek a resolution. If it is helpful to achieving a resolution, the district manager shall provide for a site visit to be taken.
 - (d) If a resolution has not been achieved, the district manager shall ask each of the Plan author, the complainant and the Local Citizens Committee to recommend their proposed solutions in writing within 15 days. The district manager shall make a decision on the issue within 15 days of receiving the submissions, and shall send a copy of the decision to the regional director, the person concerned and the Local Citizens Committee.

- (e) Written submissions from all parties involved, as well as any recommendations from the Local Citizens Committee, shall be included in the supplementary documentation which accompanies the Timber Management Plan or Plan amendment (Appendix 9, section 1(h)). This documentation shall form part of any record produced by MNR to the Ministry of Environment and Energy and Energy if there is a bump-up request.
- (f) If the person concerned is dissatisfied with the decision of the district manager, a request may be made for a review by the regional director. The request shall be made within 30 days of receiving the district manager's decision. The regional director will consider the views of the Local Citizens Committee, the Plan author and the district manager. The regional director shall provide a decision with written reasons for adopting or rejecting the decision of the district manager within 15 days.
- (g) The schedule specified for issue resolution may be compressed where necessary for insect pest management program issues.

Access to Plan Documentation:

- 65. (a) A copy of each draft and approved Timber Management Plan, and the accompanying supplementary documentation, shall be provided to the appropriate regional office of the Ministry of Environment and Energy. A copy of the summary of each approved Timber Management Plan shall be provided to the Environmental Assessment Branch of the Ministry of Environment and Energy.
- (b) Each draft Timber Management Plan and the accompanying supplementary documentation, the draft Plan summary, and the preliminary list of required alterations shall be available for public review during normal business hours at the district office, the appropriate MNR regional office and a location in Toronto provided by MNR, after the Second Information Centre has been held. Reasonable opportunities for access to the documentation during non-business hours shall be afforded.
- (c) Upon final approval of the Plan, each approved Timber Management Plan and the accompanying supplementary documentation, and the Plan summary shall be available for public inspection at the locations noted in Condition 65(b). The approved Plan shall be available at those locations for the five-year term of the Plan.

Contingency Plans:

- 66. Where a Timber Management Plan cannot be prepared and approved before the required date, a Contingency Plan shall be prepared and approved as an interim

Timber Management Plan before operations may proceed. The particulars of this condition are set out in Appendix 12.

Amendments to Timber Management Plans:

67. Amendments to an approved Timber Management Plan may be required during the five-year term. The planning process for any such amendments may be initiated by any person, by making a written request for an amendment to the district manager. Any such request shall be accompanied by sufficient information to allow the district manager to determine whether the proposed amendment should proceed, and whether the amendment should be treated as administrative, minor or major. The particulars of this condition are set out in Appendix 13.

Timber Management Plan Renewals:

68. (a) A scheduled renewal of a Timber Management Plan shall normally be undertaken for each forest management unit every five years.
- (b) An unscheduled renewal of a Timber Management Plan shall be undertaken if the current Plan is rendered obsolete at any time during its five-year term. In such circumstances, all planning requirements for timber management plans shall apply. While the new Timber Management Plan is being prepared, a Contingency Plan may be required.

Insect Pest Management Programs:

69. When programs for insect pest management are required, they shall be planned in accordance with the planning procedure for insect pest management programs. Particulars of this condition are set out in Appendix 14.

Bump-up:

70. A "bump-up" request is a request from any person to the Minister of Environment and Energy for the designation of specific proposed timber management activities to the status of an individual environmental assessment under *The Environmental Assessment Act*, R.S.O. 1990, c. E.18. A request may be made during the preparation of each Timber Management Plan; each major amendment to an approved Timber Management Plan; and each program for insect pest management. The process governing bump-up requests is set out in Appendix 15.
71. The Ministry of Environment and Energy shall not determine a bump-up request sooner than 30 days following MNR approval of the Plan and Notice of Plan inspection. Subject to the provisions of Appendix 15, the lands subject of an

outstanding issue or a bump-up request shall be excluded from operations objected to until resolution of the bump-up request.

Annual Work Schedules:

72. (a) An Annual Work Schedule shall be prepared for each forest management unit before any operations may proceed. All activities identified in an Annual Work Schedule (and any subsequent revisions to an Annual Work Schedule), must be previously approved in a Timber Management Plan, a Timber Management Plan amendment, or a program for insect pest management before they are scheduled for implementation in the Annual Work Schedule. A District review of the Annual Work Schedule (and any subsequent revisions to the Annual Work Schedule) shall be undertaken, and the Local Citizens Committee shall be provided the opportunity to inspect the Annual Work Schedule prior to its approval by the district manager.
- (b) Upon approval of the Annual Work Schedule, a Notice of Annual Work Schedule Inspection shall be issued. Requirements for service of this notice are set out in Appendix 2, part C. The timing and contents of this notice are set out in Appendix 3, part C. Details of the minimum information available at the time of issuance of this notice are set out in Appendix 4, part C.

Prescribed Burns:

73. Each prescribed burn which is undertaken for timber management purposes shall be the subject of an operational plan. Particulars of this condition are set out in Appendix 16.

Aerial Herbicide and Insecticide Projects:

74. Each project involving the aerial application of a herbicide or insecticide which is undertaken for timber management purposes shall be the subject of a project description and a project plan. Particulars of this condition are set out in Appendix 17.

Advertisements for Tree Planting Jobs:

75. MNR shall ensure that tree planting jobs in the Area of the Undertaking are advertised in Northern Ontario first so that Northern residents, particularly Aboriginals and students, will be considered for employment.

Operations Near Traplines:

76. MNR shall provide in the Code of Practice for Timber Management Operations in Riparian Areas, that operators ensure that trails used for accessing and working traplines, and portage routes used for recreational purposes be rehabilitated and unobstructed following timber operations. MNR and operators shall consult with affected trappers and recreationists prior to operations in order to identify such trails and portages.

Negotiations with Aboriginal Groups:

77. During the term of this approval, MNR district managers shall conduct negotiations at the local level with Aboriginal peoples whose communities are situated in a management unit, in order to identify and implement ways of achieving a more equal participation by Aboriginal peoples in the benefits provided through timber management planning. These negotiations will include but are not limited to the following matters:
- (a) Providing job opportunities and income associated with bush and mill operations in the vicinity of Aboriginal communities.
 - (b) Supplying wood to wood processing facilities such as sawmills in Aboriginal communities.
 - (c) Facilitation of Aboriginal third-party licence negotiations with existing licensees where opportunities exist.
 - (d) Providing timber licences to Aboriginal people where unalienated Crown timber exists close to reserves.
 - (e) Development of programs to provide jobs, training and income for Aboriginal people in timber management operations through joint projects with the Department of Indian and Northern Affairs.
 - (f) Other forest resources that may be affected by timber management or which can be addressed in the timber management planning process as provided for in Condition 23(c).

MNR shall report on the progress of these on-going negotiations district-by-district in the Annual Report on Timber Management that will be submitted to the Legislature (Condition 82 and Appendix 20).

2. The following information is required to be reported to the Legislature:

Monitoring and Reporting

Forest Management Unit Level:

78. (a) MNR shall monitor the timber management activities of access, harvest, renewal and maintenance for effects, effectiveness and compliance with approved Timber Management Plans and any other conditions imposed on operations by legislation or policy. The area inspection program and where appropriate other means such as contract administration and project supervision, will be used by MNR to monitor compliance with:
- (i) the approved Timber Management Plan, silvicultural ground rules, specific prescriptions for operations in "Areas of Concern," and exceptions to the silvicultural guides, and implementation manuals as provided for in Condition 55; and
 - (ii) acceptable practices as described in implementation manuals as amended from time to time.
- (b) When monitoring timber management activities, MNR shall record any undesirable conditions which are observed in the areas of operations, and which appear to be related to timber management activities including:
- (i) incidents of road washout in Areas of Concern and their observed environmental effects;
 - (ii) incidents of wastage of merchantable and unmerchantable timber specifying the amount of wastage by volume, the reason for wastage, and enforcement actions taken.
 - (iii) incidents of trespasses of timber operations onto reserves
- (c) For each forest management unit, area inspection reports shall document:
- (i) the location of the inspection;
 - (ii) details of the inspection including the date, identity of the inspector, type of activity inspected, purpose and method of inspection;
 - (iii) results of the inspection, including any details of non-compliance, and a description of the observed undesirable conditions (as described in Condition 78(b)); and
 - (iv) required actions and actions taken, where appropriate.
- (d) Area inspection reports for each forest management unit shall be retained at the appropriate district office and will be available for public inspection until at least one year after the expiry of a Timber Management Plan for the unit.

79. For each forest management unit, an "Annual Report" shall be prepared concerning the timber management activities which were carried out during the preceding year. The contents of this report are listed in Appendix 18.

Provincial Level:

80. MNR shall undertake long-term scientific studies to assess the effectiveness of the provincial guidelines for moose and fish habitat and tourism values. These studies shall include an assessment of the effects of current timber management practices on moose and other wildlife habitat, fish habitat and tourism values. Particulars of this condition are set out in Appendix 19.
81. MNR shall develop and implement a Provincial Wildlife Population Monitoring program within the Area of the Undertaking. This program will monitor population trends of representative terrestrial vertebrate species. Those species include:
- (a) species which benefit from application of the Timber Management Guidelines for the Provision of Moose Habitat and/or the Timber Management Guidelines for the Provision of White-Tailed Deer Habitat (in preparation);
 - (b) species which benefit from application of Timber Management Guidelines for the Provision of Pine Marten Habitat (pursuant to Condition 94(c)) and/or the Timber Management Guidelines for the Provision of Pileated Woodpecker Habitat (pursuant to Condition 94(c)); and
 - (c) species which utilize the following habitat types and features: snags, dead and downed woody material, riparian areas, mature/overmature stands, and large areas in a similar successional stage.
82. MNR shall produce a provincial "Annual Report on Timber Management" which shall be tabled in the Legislature. The contents of this report are listed in Appendix 20.
83. MNR shall continue to maintain central records on annual pesticide use for timber management purposes on Crown lands in Ontario. The contents of these records are listed in Appendix 21.
84. Every five years, MNR shall produce a provincial "State of the Forest Report" which shall be tabled in the Legislature. The contents of this report are listed in Appendix 22.

Audits:

85. MNR shall undertake interdisciplinary internal operational audits with respect to compliance with the timber management planning process, approved Timber Management Plans, implementation manuals, and relevant provincial policies,

obligations, procedures and legislation. The audit shall include an assessment of the availability of inventory information with respect to timber and non-timber values for the forest management unit for use in timber management planning, with recommendations concerning any data collection priorities that should be addressed.

In addition, the audits shall assess the effectiveness of timber management activities in achieving timber management objectives and in providing assistance in meeting non-timber objectives.

86. (a) MNR shall undertake operational audits, through the appointment of suitably qualified independent audit teams, which will include an assessment of compliance with the timber management planning process, approved Timber Management Plans, implementation manuals, and provincial policies, procedures, and legislation. At least one member of the Audit team shall be a Registered Professional Forester. Terms of reference for these audits are set out in Appendix 25.
- (b) The audits shall assess the effectiveness of timber management activities in achieving management objectives. These audits will include any assessments of silvicultural effectiveness.
- (c) MNR shall design a set of procedures and guidelines for the undertaking of these audits. These procedures and guidelines shall be designed to empower an appointed audit team to act as an independent body. The guidelines and procedures will also be constructed to meet the requirements of Section 6 of the *Crown Timber Act*, R.S.O. 1990, c. C.51, as amended, in order that the Minister of Natural Resources may report to the Legislature.
- (d) MNR shall provide remuneration and expenses for each audit team. MNR shall provide funding for the preparation and publication of the audit report by each appointed audit team.
- (e) Each Forest Management Agreement in the province shall be audited every five years. In addition, six Crown and Company Management Units shall be audited each year, starting with those units with the greatest volume of wood harvested. The audit shall examine the activities over the past five-year period beginning at a point in time which will allow comparison of three years of the previous Timber Management Plans and two years of the current Plan.
- (f) Audit reports shall be published by the audit team no later than four months after the initiation of the audit.
- (g) The independent audit teams shall provide an opportunity to the Local Citizens Committee for the forest management unit which is the subject of the audit to comment on management practices and to provide any other relevant information.

87. MNR shall continue to review and report upon the performance of Forest Management Agreement holders, in accordance with the requirements of the *Crown Timber Act*, R.S.O. 1990, c. C.51, in order to provide a recommendation to the Legislature on the extension of specific Forest Management Agreements.

Investigation and Enforcement:

88. Within one year of approval of the amendments to the *Crown Timber Act* submitted by MNR, MNR shall prepare a handbook to provide guidance to its field officers for the investigation and prosecution of offenses under the *Crown Timber Act*, *Public Lands Act*, the *Lakes and Rivers Improvement Act*, *Endangered Species Act* and other statutes relevant to timber management activities. In particular, MNR shall ensure that timber-related statutes and regulations are interpreted consistently, supervised adequately, and enforced fairly but firmly in all cases of non-compliance.

Continuing Developments and Reporting Requirements

Provincial Technical Committee:

89. MNR shall establish the Provincial Technical Committee for Timber Management as a standing committee comprised of both government and non-government members. The purposes of the Committee are to ensure that implementation manuals are kept current in light of applicable scientific knowledge and advances in analytical and operational technology, and to set priorities for work on existing or new implementation manuals. The committee may include members of the public as well as persons with professional and technical resource management expertise and familiarity with the technical aspects of timber management. (See Condition 4(a)(iii) and Appendix 1, part B).

Timber Management Planning Manual Revision:

90. (a) Within six months of the final approval of this undertaking, MNR shall produce draft revisions to the Timber Management Planning Manual for Crown Lands in Ontario ("TMPM"), incorporating the timber management planning process and Plan content requirements described in these terms and conditions. Prior to finalization of revisions to the manual, MNR will provide the Director of the Environmental Assessment Branch, Ministry of Environment and Energy, and other interested persons with an opportunity to review the draft revisions for consistency with the timber management planning process and Plan content requirements described in these terms and conditions. Any person who wishes to comment shall provide comments in writing to the Ministry of Natural Resources within three months of receipt of the draft revisions to the TMPM. The Minister of Natural Resources shall

consider those comments, and finalize the revisions to the Timber Management Planning Manual within three months thereafter.

- (b) Upon completion of the revised TMPM by MNR as provided for in Condition 90(a), parties will have one month within which to make submissions to this hearing panel in the event clarification is required regarding the Board's decision as reflected by MNR in the revised TMPM. All submissions shall be in writing and shall set out the specific amendment requested to MNR's revised TMPM. No new evidence will be considered by the Board in deciding any dispute that may arise in respect of the TMPM, and the Board's consideration shall be strictly limited to issues as to whether the terms and conditions of approval are fairly reflected in the TMPM.

Timber Management Planning Brochure:

- 91. Within one year of the final approval, MNR shall prepare a brochure for general public distribution which will outline the timber management planning process in simplified form and provide a glossary of terms which are commonly used. The brochure will also outline how and when the public may become involved in the timber management planning process, and will provide an explanation of bump-up provisions. The brochure will be available in English, French and native languages.
- 92. MNR shall expand its public education program dealing specifically with the topics of:
 - (a) the origins of the boreal forest and the need for disturbance to create new forests;
 - (b) the use of clearcut harvesting and the role it plays in regeneration of the forest; and
 - (c) the use of pesticides in timber management.

MNR shall invite input from the intervenors of the Timber Management Class Environmental Assessment Hearing in the preparation of this initiative.

Implementation Manuals:

- 93. (a) Within five years of this approval, and thereafter at least every five years, MNR shall review each implementation manual to determine the need for revision or amalgamation of the existing manuals or preparation of any new manuals. The Provincial Technical Committee shall have an integral role in the review of existing implementation manuals, and the setting of priorities for revision or amalgamation of the existing manuals or preparation of any new manuals which may be required from time to time.

- (b) Any revision or amalgamation of the existing implementation manuals, or preparation of any new manuals shall be undertaken by suitably qualified persons.
 - (c) The intent of the review of the manuals is to ensure that they reflect current scientific knowledge as it applies to Ontario. In considering the need for revisions, amalgamations or new manuals, in setting priorities, and in determining the appropriate contents of the manuals, the following factors shall be considered:
 - (i) the results of applicable scientific research;
 - (ii) the results of monitoring programs described in Conditions 55, and 78-84;
 - (iii) the advantages and disadvantages of changes to current timber management practices; and
 - (iv) advances in analytical and operational technology.
 - (d) Where existing manuals are revised or amalgamated, or new manuals are prepared, draft manuals shall be subject to review by appropriate government ministries and agencies, known provincial organizations and associations with expertise in the subject matter, and representatives of Local Citizens Committees prior to finalization and approval by MNR.
94. (a) In accordance with the foregoing procedure, all existing silvicultural guides shall be reviewed to ensure that they reflect current scientific knowledge as it applies to Ontario, and revised to provide descriptions of general standard site types for use in developing Silvicultural Ground Rules in Timber Management Plans. Those revisions shall be completed within three years of this approval.
- (b) MNR shall produce a new implementation manual to address operational considerations for the activities of harvest, renewal and maintenance with the specific purpose of addressing protection of the physical environment, and to provide direction in relation to harvest layout, configuration and clearcut sizes. For the purposes of these terms and conditions, the working title of this implementation manual is "Environmental Guidelines for Timber Management Activities."
 - (c) MNR shall produce Timber Management Guidelines for the Provision of Pine Marten Habitat and Timber Management Guidelines for the Provision of Pileated Woodpecker Habitat. These guidelines shall be prepared and implemented within two years of this approval.
 - (d) MNR shall undertake, with the assistance of the Provincial Technical Committee, the preparation and completion of a mixed wood silvicultural guide.

Information Collection and Management:

95. MNR shall accelerate its program of inventory information collection concerning the timber resources and other values on Crown lands in the Area of the Undertaking for use in timber management planning. MNR shall enhance development of its information management systems to ensure that data is systematically collected, updated and stored; is easily retrievable by those involved in timber management planning; and is available to the public.
96. MNR shall improve its assessment, recording and reporting of silvicultural effectiveness related to both natural and artificial renewal methods, through the development of programs to address the following subject areas:
 - (a) the maintenance of silvicultural records of prescriptions and their results;
 - (b) the enhancement of record keeping methodologies in order to provide for improved tracking of the linkages among silvicultural guides, Silvicultural Ground Rules, project records, Free-to-Grow Assessments and other condition survey records, and Forest Resource Inventory updating;
 - (c) the enhancement of methodologies and tools for analysis of silvicultural trend data to assess the effectiveness of prescriptions; and
 - (d) the systematic reporting of results of renewal activities to the general public.
97. MNR shall continue the development of the Forest Ecosystem Classification Program through the following initiatives:
 - (a) the completion of "interpretation manuals" to assist in application of the Forest Ecosystem Classification program;
 - (b) the examination of improved inventory and mapping technologies;
 - (c) the expansion of the program throughout the Area of the Undertaking; and
 - (d) the enhancement of technology transfer and training programs.
98. Within three years of this approval, the Ministry of Natural Resources shall develop a Northern Ontario Wetlands Evaluation System, to provide information on wetlands for use in timber management planning.
99. Within five years of this approval, the Ministry of Natural Resources shall complete surveys which identify candidate life science Areas of Natural and Scientific Interest (ANSIs) in all Site Regions and significant earth science ANSIs within the Area of the Undertaking for use in timber management planning.

Scientific Research and Technical Development:

100. MNR shall design and implement a provincially coordinated program to obtain further information on forest growth and yield as influenced by site, forest structure, silvicultural treatments and natural events.
101. MNR shall design and implement a study pertaining to the effects of full-tree harvest and full-tree chipping on long-term forest productivity.
102. MNR shall ensure that tending and protection programs are conducted in accordance with current scientific knowledge applicable to Ontario's forests by maintaining policies and procedures that ensure proper and safe use of registered and approved products; investigating new technologies; testing alternative control methods; and supporting research initiatives.
103.
 - (a) During the term of this approval, MNR shall investigate the subject of "old growth" ecosystems and develop a policy to provide an environmentally sound conservation strategy, and definitions of old growth specific to Ontario forest conditions.
 - (b) As an interim measure, within two years of this approval, MNR shall develop management direction concerning old-growth values for use in timber management planning.
 - (c) MNR shall provide an environmentally sound conservation strategy and management direction concerning red and white pine old-growth values for use in timber management planning across the Area of the Undertaking by May 1995.
 - (d) Old growth red and white pine stands within site region 4E shall continue to be excluded from harvesting until such a policy is provided and implemented.
 - (e) For the purpose of this approval, and until a provincially coordinated general policy setting out an environmentally sound conservation strategy is provided which,
 - (i) defines old growth white and red pine or deems what is old growth white and red pine, and
 - (ii) provides a specific process to identify and plan for the management and conservation of old growth white and red pine,

Timber Management Plans must record as values pursuant to Appendix 5, part B, section 1(a)(iv) all sites found to contain communities of old growth white and red pine. Where candidate sites are omitted from the values list and values maps, the Plan must record the reasons the site does not constitute old growth white or red pine.

104. Within two years of this approval, MNR shall investigate available analytical methods for assessing social and economic advantages and disadvantages and their applicability to Ontario's timber management operations, and shall develop or adopt appropriate methodologies for use in timber management planning.
105. MNR shall complete and submit for approval a new Timber Production Policy and related implementation schedule by no later than December 31, 1994. The Timber Production Policy shall be updated thereafter every five years.
 - (a) The Timber Production Policy shall be prepared in consultation with the public generally and with input from the various advisory committees described in Appendix 1.
 - (b) The Timber Production Policy shall provide clear quantifiable objectives for a sustainable level of harvest and regeneration on a 20-year projection as well as for the five-year term of the policy. These objectives shall be provided for the entire Area of the Undertaking and for all individual management units.
 - (c) The Timber Production Policy shall develop estimates of funding required to meet regeneration objectives for the Area of the Undertaking and for individual management units.
 - (d) The sustainable harvest level and regeneration objective for the province in the updated Timber Production Policy shall be reported in the State of the Forest Report (Appendix 22, section 1(i)).
106. Within three years of this approval, MNR shall develop a provincial policy on roadless wilderness areas.
107. During the term of this approval, MNR shall continue to examine wildlife habitat supply modelling methodologies, and landscape management methodologies as potential means of addressing biological diversity concerns in timber management planning.
108. During the term of this approval, MNR shall continue its development of Geographic Information System technology for use in timber management planning in Ontario and the transfer of that technology to field offices in the Area of the Undertaking.
109. MNR shall further develop comprehensive professional and technical training programs to ensure that the knowledge of those persons involved in the planning and implementation of timber management activities is continually upgraded. Particulars of this condition are set out in Appendix 23.

District Land Use Guidelines:

110. Revisions to the District Land Use Guidelines designating permitted land uses throughout the Area of the Undertaking shall be made in consultation with the

committees listed under Appendix 1. MNR shall report on the status of the District Land Use Guidelines undertaking in the Annual Report on Timber Management to the Legislature pursuant to Condition 82, and in the report to the Minister of Environment and Energy pursuant to Condition 114(a)(v).

Progress Reports:

111. MNR shall provide progress reports on improvement of implementation manuals, advances in information collection and management, scientific research and technical development, and professional and technical training to the director of the Environmental Assessment Branch, Ministry of Environment and Energy. In providing the foregoing information, MNR shall describe the results of any scientific research, pilot projects or case studies undertaken. These reports will describe any new analytical methods or technologies which have been developed for use in timber management, and shall make recommendations concerning whether the use of specific new technologies may require amendments to the approval for the undertaking. These reports shall be available to the public.

Approval Period & Review Requirements

112. (a) Amendments to the approval for the undertaking during the term of this approval may be required to enable:
 - (i) clarification or improvement of the timber management planning process and Plan content requirements described in these terms and conditions;
 - (ii) clarification or improvement of the provisions for monitoring described in these terms and conditions; or
 - (iii) extension of the approved undertaking to include new technologies which may become regular operational practice in the future.
- (b) In cases where an amendment to the approval for the undertaking is required, the procedure set out in Appendix 24 shall apply.
113. (a) This approval shall remain in effect for nine years. The first year shall be deemed to start on the day that this decision is received by the Minister of Environment and Energy.
- (b) Upon completion of the revisions to the Timber Management Planning Manual, in compliance with Condition 90, the timber management planning process and Plan content requirements described in these terms and conditions shall come into force at the time of the next amendment to the existing Timber Management Plan with whatever modifications are necessary in the circumstances, or the next scheduled or unscheduled renewal of the Timber Management Plan for each forest management unit.

- (c) All other terms and conditions shall come into force as provided in these terms and conditions of approval.
114. (a) During the eighth year of this approval, MNR shall undertake a review of this undertaking and submit that review to the Minister of Environment and Energy and shall make the review publicly available at the same time. The review shall make recommendations regarding an extension and amendment of this approval on the basis of supporting information which shall consist of:
- (i) a complete record of all amendments to the approval pursuant to Condition 112 for the undertaking during the term of this approval;
 - (ii) a complete record of all amendments to Timber Management Plans detailing their categorization as administrative, minor or major as set out in Condition 67 and Appendix 13;
 - (iii) a complete record of all bump-up requests, and their disposition, during the term of this approval;
 - (iv) the most recent five-year "State of the Forest" report, which is described in Condition 84 and Appendix 22;
 - (v) progress reports on the studies and programs which are described in Conditions 24, 27, 52(e), 80, 81, 93 to 110 and Appendix 19;
 - (vi) any additional documentation which MNR considers to be appropriate or necessary to support its recommendations for an extension of the approval of the undertaking;
 - (vii) an overview of the success and failure of public consultation reported by
 - Local Citizens Committees and contained in supplementary documentation of Timber Management Plans,
 - any similar statement resulting from the native consultation process, and
 - the issue resolution process;
 - (viii) a complete record of all Contingency Plans as set out in Condition 66 and Appendix 12;
 - (ix) a complete record of major problems identified through the independent audit program as provided in Condition 86; and
 - (x) a complete record of estimated and actual spending to achieve regeneration objectives as provided for in Condition 38(a); Appendix 8,

section 1(a)(iv); Appendix 18, section 1(o); Appendix 20, section 1(g); and Appendix 22, section 1(k).

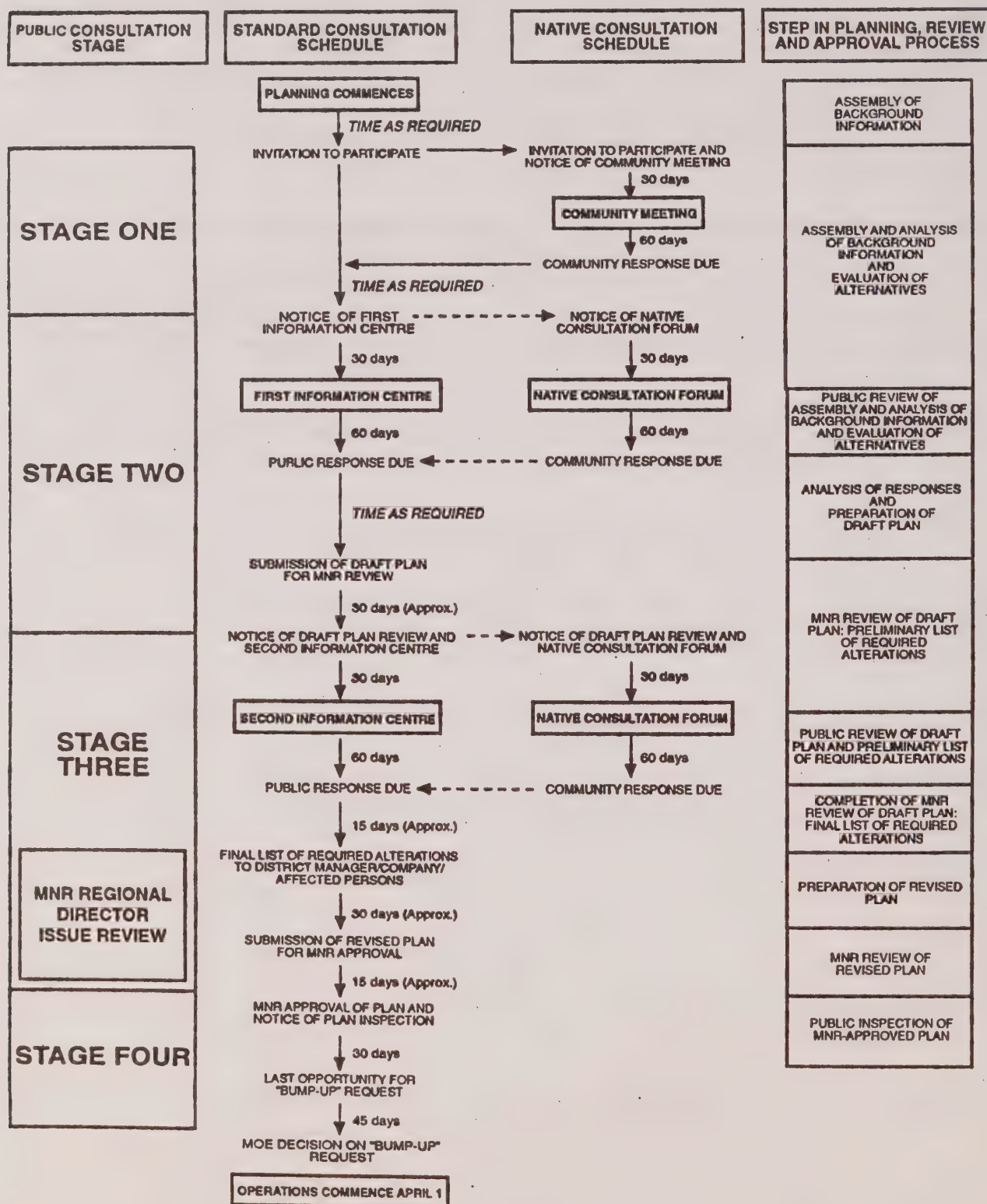
- (b) The public shall be provided 60 days after the report is made public to make written comments to the Minister of Environment and Energy on the review documentation and any recommendations prepared by MNR.
- (c) The Minister of Environment and Energy will determine whether the Class EA approval shall be extended beyond the term of this approval no later than six months after receiving MNR's review and recommendations.

Record of the Timber Management Planning Class EA Hearing:

115. MNR shall provide copies of the recorded proceedings of the Timber Management Planning Class Environmental Assessment Hearing including transcripts, exhibits, final argument and where possible, interrogatories, to Lakehead University and the University of Toronto, for academic and research purposes. MNR shall also maintain a copy in its main office in Toronto. The Ministry of Environment and Energy shall maintain a copy in the Environmental Assessment Branch for public use and for its own use in monitoring compliance with this approval.

Figure 1

SCHEDULE: TIMBER MANAGEMENT PLAN PRODUCTION, REVIEW AND APPROVAL



APPENDICES

APPENDIX 1: COMMITTEES

A: The Senior Provincial Policy Committee

1. Purpose

The purpose of the Provincial Policy Committee is to

- (a) review the appropriateness of policies at a provincial level for timber management as well as those resources which influence or are impacted by the management of the timber resources ("the policies");
- (b) review the funding levels of the policies;
- (c) determine the inter-relational effects of the policies; and
- (d) act as a standing Advisory Committee to MNR on the matters referred to in (a), (b) and (c).

2. Formation

- (a) The Minister of Natural Resources shall appoint members to this committee and the Deputy Minister of Natural Resources will chair the committee.
- (b) The Minister of Natural Resources shall appoint members to this committee from industry associations, unions, chambers of commerce, recreation groups, environmental groups, native organizations, and other groups, as well as representatives of foresters, trappers, municipalities and other interested individuals.
- (c) Individual members shall be appointed to this committee for a three year term with sufficient re-appointments for an annual turnover of one third of members commencing in the fourth year of the establishment of the committee.
- (d) The committee shall meet at least twice annually.
- (e) The committee shall keep minutes which shall be publicly available.
- (f) The committee members shall receive expenses for their attendance at meetings.

B: The Provincial Technical Committee:**1. Purpose**

The Provincial Technical Committee will:

- (a) ensure that implementation manuals are kept current in the light of advances in scientific knowledge and management practices.
- (b) act as a review board for proposed changes, emanating from either a field or a policy level to any implementation manual referred to in Appendix 7, and to set priorities for work on existing or new implementation manuals.
- (c) deal with any other matters identified by the deputy minister.

2. Formation and Membership

- (a) The Deputy Minister of Natural Resources shall appoint members to this committee.
- (b) One member will be appointed from each professional discipline required, in the opinion of MNR, for the management of the timber resource and of non-timber resources of the province.
- (c) Where possible, membership shall include knowledgeable members of the public.
- (d) The term of appointment of the committee members will be initially for a three-year period with a year-by-year renewal provision to be exercised at the discretion of MNR.

3. Responsibilities

It is the responsibility of this committee to:

- (a) establish interdisciplinary teams as required to:
 - (i) review results of monitoring programs;
 - (ii) review individual implementation manuals;
 - (iii) obtain input from recognized experts (both internal and external to MNR) during the review of the implementation manuals; and
 - (iv) to bring recommendations before the committee.
- (b) bring to the Provincial Policy Committee proposed changes to guidelines and manuals with a supporting rationale for the proposed changes and an

implementation strategy. The Policy Committee will give its advice to the minister.

- (c) committee members shall receive expenses for their attendance at meetings.

C: The Regional Advisory Committee

1. Purpose

The purpose of the Regional Advisory Committee is to act as both an advisory committee to MNR and as a "sounding board" for problems arising in the course of reaching regional resource management objectives and decisions.

2. Formation and Membership

- (a) Each Regional Advisory Committee shall be chaired by the appropriate MNR regional director, who will represent the Ministry.
- (b) Each regional director of the Ministry shall appoint, as members to the Regional Advisory Committee for the region, a regional representative of:
 - (i) The Ontario Parks Council
 - (ii) The Northern Ontario Tourist Outfitters Association
 - (iii) The Ontario Federation of Anglers and Hunters
 - (iv) The Ontario Forest Industries Association
 - (v) The Ontario Lumber Manufacturers Association
 - (vi) The Ontario Trappers Association
 - (vii) Native Peoples Organizations
 - (viii) Ontario Campers Association
 - (ix) The Ontario Federation of Naturalists and other environmental groups
 - (x) The Ontario Association of Chambers of Commerce
 - (xi) The Ontario Professional Foresters Association
 - (xii) The Ontario Association of Municipalities
 - (xiii) Forest Industry workers
 - (xiv) Trade unions
 - (xv) Other interest groups.
- (c) Each regional director shall have the discretion to expand the Regional Advisory Committee membership to reflect a balance of local concerns.
- (d) Each member of a Regional Advisory Committee shall serve for a three-year term.
- (e) Each Regional Advisory Committee will be a standing committee which shall meet at least quarterly.
- (f) The committee members shall receive expenses for their attendance at meetings.

3. Responsibilities

Each Regional Advisory Committee will be strongly supported by MNR, which will act as the secretariat and provide the necessary background information to do the following:

- (a) review provincial goals and policies as translated by MNR regional staff into numerically quantified regional objectives.
- (b) review background information for the timber resource and those resources which influence or are impacted by the management of the timber resource.
- (c) review the degree of success of past practices at a forest management unit level in order to determine whether regional objectives and targets are being met.
- (d) provide guidance to the regional level of the MNR for the criteria applicable to Timber Management Plan approval.
- (e) Provide input (in the form of either minutes and/or direct communication) to local forest management units in its region.

4. Jurisdiction

The geographic area of jurisdiction of each Regional Advisory Committee will be an existing region with boundary modification such that (to the extent possible) individual forest management units for timber and other resources be either "in" or "out" of the region.

D: The Local Citizens Committee:

1. Composition and Formation:

The Local Citizens Committee shall be a standing committee. Membership shall be by appointment from the district manager. The majority of appointments shall be drawn from nominations from interest groups. The main interests represented on this committee should include:

- (a) local business;
- (b) tourism industry;
- (c) anglers and hunters;
- (d) native communities;
- (e) forest industry;
- (f) naturalists;
- (g) municipalities;
- (h) trappers and other resource users;
- (i) other Crown Land recreationalists;
- (j) forest industry trade unions;

- (k) woodworkers;
- (l) small independent loggers;
- (m) Chamber of Commerce member or Economic Development Officer;
- (n) other interest groups; and
- (o) the general public.

2. Purposes:

The purpose of the Local Citizens Committee is to participate as an integral part of the timber management planning process by:

- (a) ensuring that all local interests are effectively communicated to all others involved in timber management planning;
- (b) increasing the effectiveness of the four-stage public consultation process (described in Conditions 9 to 12), by participating in its implementation, and in the consideration of any additional formal public consultation opportunities that would be useful, in the context of local circumstances and needs;
- (c) participating in the development, identification and description of objectives, strategies, problems and issues (described in Conditions 22 and 23).
- (d) participating in the development of the values map(s) (described in Condition 17);
- (e) promoting integration of all interests by participating in the evaluation of trade-offs to be made during the planning process and the resolution of problems, differences and conflicts as early as possible in the planning process;
- (f) assisting in monitoring the performance of Timber Management Plan implementation; and
- (g) providing advice to the district manager when discretionary decisions must be made (e.g.: the categorization of amendments, and responses to bump up requests).

3. Local Citizens Committee input to the Planning Team and to Insect Pest Management:

- (a) The Local Citizens Committee may nominate a representative of the Committee to serve as a member of the timber management planning team.
- (b) Other members of the Local Citizens Committee may attend planning team meetings as observers.

- (c) Joint meetings of the Local Citizens Committee and the planning team shall be held at agreed upon stages of the planning process.
- (d) The planning team and representatives of the Local Citizens Committee shall attend public information centres.
- (e) The member of the Local Citizens Committee who serves as the representative on the planning team shall be invited to serve on the district or regional Multi-Disciplinary Committee which produces the district insect pest management program.

4. Procedural Matters:

The Local Citizens Committee shall develop its own rules with respect to any procedural matters required to meet its responsibilities during timber management planning and Plan implementation. These matters include such things as frequency of and attendance at meetings and Information Centres, and circulation of information among members of the Local Citizens Committee.

5. Disbursements and Support:

- (a) Members of the Local Citizens Committee shall be reimbursed by MNR for reasonable out-of-pocket expenses in connection with their participation.
- (b) The LCC member serving on the planning team shall be provided a reasonable per diem fee for attendance at planning team meetings.
- (c) MNR shall provide the necessary office support, e.g., secretarial support and typing of report for supplementary documentation, for the affairs of the Committee to be conducted efficiently and effectively.
- (d) Each MNR district manager shall provide to the Local Citizens Committee any information required by the Committee. This information will be provided as it becomes available, in order to ensure achievement of the Local Citizens Committee purposes. Without limiting the generality of the foregoing, each Local Citizens Committee will be provided with the following materials for the relevant Management Unit, in summary form and at a time no later than the invitation to participate:
 - (i) background information;
 - (ii) data describing non-timber resources; and
 - (iii) data describing the timber resource.

6. Reports and Records:

- (a) All documentation produced by the Local Citizens Committee shall be available for review by interested persons. In particular, the Local Citizens Committee shall prepare a report concerning their activities during Timber

Management Plan preparation; the problems and issues addressed by them; and their assessment of the effectiveness of the Committee structure and recommendations for change, if any and an assessment of the co-operation provided to the committee by the Ministry. This report shall be summarized by the LCC and provided as follows:

- (i) in an early version for inclusion in the Preliminary Plan Summary to be distributed at the First Information Centre (Condition 10(a) and Appendix 4, part A, section 2(a));
 - (ii) in final form for inclusion in the Draft Plan Summary (Conditions 11(a) and 58; Appendix 4, part A, section 3(a)(iv); Appendix 11) and revised, if necessary for the final Plan;
 - (iii) as part of the Timber Management Plan Summary (Conditions 12 and 58; Appendix 11, section 1(d).
 - (iv) the full report of the Local Citizens Committee shall form part of the supplementary documentation of the Timber Management Plan (Condition 56, Appendix 9, section 1(f).
- (b) Timber Management Plans shall contain a brief statement on the first page reporting generally the Local Citizens Committee's agreement or disagreement with the Plan and indicating that the Local Citizens Committee's report is available in the Supplementary Documentation to the Plan.

APPENDIX 2: PUBLIC NOTICE REQUIREMENTS: SERVICE**SERVICE OF NOTICE WITH RESPECT TO TIMBER MANAGEMENT PLANNING****A: Notices for Timber Management Plans:**

1. Public notice requirements for each Public Notice referred to in Conditions 9 to 12 and Appendices 3 and 4 shall include direct written notice from the MNR district manager to:
 - (a) local and regional offices of relevant government ministries and agencies and in particular to:
 - (i) local school boards,
 - (ii) local medical officers of health,
 - (iii) each municipality and planning board, and where appropriate, local services board and Chambers of Commerce,
 - (iv) Regional Manager of Engineering and Right-of-Way, Regional Office, Ministry of Transportation,
 - (v) Director, Design and Development Division - Transmission, Main Office, Ontario Hydro,
 - (vi) Regional Office, Ministry of Environment and Energy,
 - (vii) Regional Office, Ministry of Culture, Tourism and Recreation,
 - (viii) Regional Office, Ministry of Northern Development and Mines,
 - (ix) Ontario Native Affairs Secretariat,
 - (x) Department of Indian Affairs (Canada), and
 - (xi) Department of Fisheries and Oceans (Canada);
 - (b) native communities and Band Councils of each Indian Reserve in or adjacent to the forest management unit;
 - (c) appropriate Treaty Organizations and Tribal Councils;
 - (d) known local and provincial organizations and associations;
 - (e) members of the Local Citizens Committee; and

- (f) individual members of the public with a known interest in timber management planning for the management unit, including those persons who may be directly affected by timber management operations during the five-year term of the Timber Management Plan, such as tourist operators and trappers. MNR shall make all reasonable efforts to identify individuals who may be directly affected. Without limiting the generality of the foregoing, reasonable efforts shall include contacting Band Councils and native communities in or adjacent to the forest management unit, and consulting records of registered trap-line areas and mining activity.
2. Timber Management Native Consultation Program: In those cases where a native community has chosen to be involved in the Timber Management Native Consultation Program, any additional notices required shall be provided to:
- (a) the native community, by serving the Band Councils of each Indian Reserve or other identified community representatives,
 - (b) individual members of the community with a known interest in timber management planning for the forest management unit,
 - (c) appropriate Treaty Organizations and Tribal Councils,
 - (d) members of the Local Citizens Committee,
 - (e) local planning or services boards,
 - (f) Regional Office, Ministry of Environment and Energy,
 - (g) Regional Office, Ministry of Culture, Tourism and Récréation,
 - (h) Regional Office, Ministry of Northern Development and Mines,
 - (j) Ontario Native Affairs Secretariat, and
 - (k) Department of Indian Affairs (Canada).
- 3.
- (a) Direct verbal communication of the required information, with whatever modifications are necessary, may serve as an additional form of notification, where appropriate.
 - (b) The provisions of The *French Language Services Act, 1986*, as amended from time to time, shall govern the translation of Notices into the French language.
 - (c) Notices to Band Councils and native communities and organizations will be provided in English and the appropriate native languages, unless the specific Band Council, native community or organization advises that notice in native languages is not necessary.

4. (a) Public notice requirements for each notification shall also include general public notices in the form of advertisements in the local media, including publications in the native media.
- (b) Where such notices are published in print media, the contents of the notices shall conform with the requirements set out in Appendix 3, part E.

B: Notices for Contingency Plans, Amendments and Insect Pest Management Programs:

1. Notices associated with Contingency Plans, amendments to Timber Management Plans and insect pest management programs which include proposals for projects involving aerial application of insecticides (described in Appendix 12, 13 and 14 respectively) shall be served upon the same persons and organizations, and by the same methods, as those for Timber Management Plans, with whatever modifications are necessary in the circumstances.

SERVICE OF NOTICES WITH RESPECT TO OPERATIONAL MATTERS

C: Notices for Annual Work Schedules:

1. Public notice for each Annual Work Schedule (and any subsequent revisions to an Annual Work Schedule) shall include direct written notice from the MNR district manager to those persons who have identified themselves as having an interest in, or who are known to be directly affected by, the operations scheduled in the Annual Work Schedule.
2. Reasonable efforts shall be made to identify persons who may be directly affected by timber management operations during the term of the Annual Work Schedule, and in particular those persons who have requested notice of specific activities occurring in specific areas. Without limiting the generality of the foregoing, reasonable efforts shall include contacting Band Councils and native communities in or adjacent to the forest management unit, and consulting records of registered trapline areas and mining activity.
3. (a) Direct verbal communication of the required information, with whatever modifications are necessary, may serve as an additional form of notification, where appropriate.
- (b) The provisions of *The French Language Services Act, 1986*, as amended from time to time, shall govern the translation of Notices into the French language.
- (c) Notices to Band Councils and native communities and organizations will be provided in English and the appropriate native languages, unless the specific Band Council, native community or organization advises that notice in native languages is not necessary.

4. (a) Public notice requirements shall also include general public notices in the form of advertisements in the local media, including publications in the native media.
- (b) Where such notices are published in print media, the contents of the notices shall conform with the requirements set out in Appendix 3, part F.

D: Notices for Prescribed Burns and Notices for Aerial Applications of Herbicides and Insecticides:

1. Notices associated with prescribed burns and aerial applications of herbicides and insecticides shall be served upon the same persons and organizations, and by the same methods, as those for Annual Work Schedules, with whatever modifications are necessary in the circumstances.

APPENDIX 3: PUBLIC NOTICE REQUIREMENTS: TIMING AND NOTICE CONTENTS

[NOTE: THE MINIMUM INFORMATION AVAILABLE AT EACH STAGE OF THE PUBLIC CONSULTATION PROCESS IS LISTED IN APPENDIX 4]

All references to days in these Public Notice requirements are to consecutive calendar days.

TIMING AND CONTENTS OF NOTICES WITH RESPECT TO TIMBER MANAGEMENT PLANNING**A: Notices for Timber Management Plans:**

Public notice shall be given by the MNR district manager at each of the four stages of the public consultation process for each Timber Management Plan:

1. Stage One: Invitation to Participate:

(a) The Invitation to Participate shall contain the following information:

- (i) a statement that the purpose of this public consultation opportunity is to provide access to information to be used in the timber management planning process, and to obtain contributions to the background information base to be used in timber management planning;
- (ii) a map of the forest management unit for which the Timber Management Plan will be prepared, containing sufficient detail to allow for identification of the location of the forest management unit;
- (iii) an outline of the subject matter to be covered by the Plan (normally the harvest, renewal and tending operations, consideration of concerns of other users/uses of the forest, and the locations of roads);
- (iv) a summary of the schedule for all formal public consultation opportunities which will be provided during the preparation of the Timber Management Plan, and a statement encouraging public involvement as early as possible in the planning process;
- (v) a statement that further information about the timber management planning process, information to be used in the preparation of the Timber Management Plan, and background information about the forest management unit may be obtained from the district office;
- (vi) a statement that information to be used in the preparation of the Timber Management Plan, and background information about the forest management unit will be displayed for public review at the district office for a specified time period, and that the information is also available during non-business hours by appointment;

- (vii) a statement requesting interested persons to provide additional background information or to state issues or concerns which need to be addressed during the planning process to the district manager and/or the Local Citizens Committee;
 - (viii) the identity of the Plan author and other members of the planning team and information concerning how to contact the district manager, the Plan author and a representative of the Local Citizens Committee;
 - (ix) a brief explanation of how comments received will be handled under relevant provisions of the *Freedom of Information and Protection of Privacy Act*; and
 - (x) a statement that there is an opportunity at any time during the timber management planning process to make a request to the Minister of Environment and Energy for a bump-up of specific proposed timber management activities to the status of an individual environmental assessment.
- (b) An Invitation to Participate and a Notice of Community Meeting(s) shall also be provided to each native community in or adjacent to the forest management unit at the same time as the standard Invitation to Participate.

In addition to the information required in the standard Invitation to Participate, the Notice shall contain the following information:

- (i) a statement that the purpose of the Community Meeting is to review and solicit comments on the draft Native Background Information Report; to determine whether additional information is required and to arrange for its collection; and to provide an opportunity for the native community to choose between the standard public consultation provisions of the timber management planning process and the Timber Management Native Consultation Program;
- (ii) the location, date and time of the Community Meeting; and
- (iii) a statement that the native community is asked to advise MNR whether they wish to become involved in the Timber Management Native Consultation Program within 60 days after the Community Meeting.

2. Stage Two: Notice of First Information Centre

A Notice of the First Information Centre shall be provided at least 30 days before the date of the Information Centre.

- (a) In addition to the information required by Appendix 3, part A, section 1(a) (ii),(iii),(viii), (ix) and (x), the Notice of the First Information Centre shall contain the following information:
- (i) a statement that the purpose of this public consultation opportunity is to provide formal opportunities for public comment on the assembly and analysis of background information and the evaluation of alternatives; to generate additional alternatives for consideration; and to request additional contributions to the information base and other information to be considered in decision-making;
 - (ii) the location(s), date(s) and time(s) of the Information Centre(s), and a statement that the purpose of the Information Centre(s) is to provide an opportunity for interested persons to comment before decisions are made and a draft Timber Management Plan is submitted to MNR for review and approval;
 - (iii) a statement that the analysis of background information and the evaluation of alternatives may also be reviewed after the Information Centre, by arranging an appointment through the district manager;
 - (iv) details of any further formal public consultation that may be scheduled as a result of recommendations by the Local Citizens Committee;
 - (v) a statement that a mapped summary of the proposed areas of operations and alternative road corridors may be obtained from the district office;
 - (vi) a statement that interested persons are asked to provide comments within 90 days of the issuance of this Notice (for the assistance of the public, a specific date shall be provided); and
 - (vii) the projected date for draft Plan submission.
- (b) In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, MNR and the native community (in conjunction with the company's Plan author, where appropriate) shall agree upon the forum to be used for discussion of the Preliminary Report on the Protection of Identified Native Values. At the time of issuance of the Notice of the First Information Centre, MNR shall provide to the native community a Notice of Review of the Preliminary Report on the Protection of Identified Native Values. In addition to the information required by Appendix 3, part A, section 1(a) (ii),(iii),(viii), (ix) and (x), the Notice shall contain the following information:
- (i) a statement that the purpose of this stage of consultation is for the community to review and comment on the Report and all other analysis of background information and evaluation of alternatives for

the Plan; to generate additional alternatives for consideration; and to obtain information on the native communities' preferred alternatives;

- (ii) a statement that the Report may be obtained from the district office or the Band Office;
- (iii) the location(s), date(s) and time(s) of any further Community Meeting(s) agreed to by the planning team and the native community, or the information required to inform community members about means of participating in any other Consultation Forum agreed to;
- (iv) the name of the native community contact person and an MNR contact person;
- (v) a statement that the native community is asked to provide comments within 90 days of the issuance of this Notice (for the assistance of the native community, a specific date shall be provided); and
- (vi) the projected date for draft Plan submission.

3. Stage Three: Notice of Draft Plan Review and Notice of the Second Information Centre

The Notice of Draft Plan Review and Notice of the Second Information Centre shall be provided at least 30 days before the date of the Information Centre.

- (a) In addition to the information required by Appendix 3, part A, section 1(a)(ii),(viii),(ix) and (x), the Notice shall contain the following information:
 - (i) a statement that the purpose of this public consultation opportunity is to provide formal opportunities for public review of, and comment on, the proposed operations before MNR finalizes its review of the draft Timber Management Plan;
 - (ii) a statement that the draft Timber Management Plan, accompanying supplementary documentation, and MNR's preliminary list of required alterations, are available for review;
 - (iii) the location(s), date(s) and time(s) of the Information Centre(s), and a statement that the purpose of the Information Centre(s) is to provide an opportunity for interested persons to review and comment on the draft Timber Management Plan. The notice shall also indicate any other location(s), date(s) and time(s) in which the draft Timber Management Plan can be reviewed, including the district office at specified times and by appointment during non-business hours, and the additional locations listed in Condition 65;

- (iv) details of any further formal public consultation that may be scheduled as a result of recommendations by the Local Citizens Committee;
 - (v) a statement that the summary of the draft Timber Management Plan may be obtained from the district office;
 - (vi) a statement that interested persons are asked to provide comments within 90 days of the issuance of this Notice (for the assistance of the public, a specific date shall be provided); and
 - (vii) the projected date for MNR approval of the Plan.
- (b) In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, MNR and the native community (in conjunction with the company's Plan author, where appropriate) shall agree upon the forum to be used for discussion of the Final Report on the Protection of Identified Native Values. At the time of issuance of the Notice of Draft Plan Review and Notice of the Second Information Centre, MNR shall provide to the native community a Notice of Review of the Final Report on the Protection of Identified Native Values. In addition to the information required by Appendix 3, part A, section 1(a) (ii),(viii),(ix) and (x), the Notice shall contain the following information:
- (i) a statement that the purpose of this stage of consultation is for the community to review and comment on the Report before MNR finalizes its review of the draft Timber Management Plan;
 - (ii) a statement that the Report may be obtained from the district office or the Band Office;
 - (iii) the location(s), date(s) and time(s) of any further Community Meeting(s) agreed to by MNR and the native community, or the information required to inform community members about means of participating in any other Consultation Forum agreed to;
 - (iv) the name of the native community contact person and the MNR contact person;
 - (v) a statement that the native community is asked to provide comments within 90 days of the issuance of this Notice (for the assistance of the native community, a specific date shall be provided); and
 - (vi) the projected date for MNR approval of the Plan.

4. Stage Four: Notice of Plan Inspection

A Notice of Plan Inspection shall be provided upon MNR approval of the timber management Plan. This notice shall be provided at least 75 days before Plan implementation.

In addition to the information required by Appendix 3, part A, section 1(a) (ii), (viii) and (ix), this notice shall contain the following information:

- (a) a statement that the purpose of this public consultation opportunity is to advise the public that planning has been completed for the forest management unit, and to provide a formal opportunity for the public to examine the results of the planning process;
- (b) the location(s), date(s) and time(s) in which the MNR-approved Timber Management Plan can be inspected, including the district office at specified times and by appointment during non-business hours, and the additional locations listed in Condition 65;
- (c) a statement that the summary of the MNR-approved Timber Management Plan may be obtained from the district office; and
- (d) a statement that there is a 30-day period following the public notice, during which there is a final opportunity for interested persons to make a request to the Minister of Environment and Energy for a bump-up of specific proposed timber management activities to the status of an individual environmental assessment, and that a response to the request will be provided by the Minister of Environment and Energy within 45 days after the 30-day period.

B: Notices for Contingency Plans, Amendments and Insect Pest Management Programs:

- 1. The timing and contents of the notices required for Contingency Plans, amendments to Timber Management Plans and insect pest management programs which include proposals for projects involving aerial application of insecticides (described in Appendix 12, 13 and 14 respectively) shall be similar to those used for Timber Management Plans, with whatever modifications are necessary in the circumstances. Notices will normally contain the following information:
 - (a) a statement of the purpose of the public consultation opportunity;
 - (b) a map of the forest management unit/District for which the Contingency Plan, amendment or insect pest management program is being prepared;
 - (c) a description of the subject matter of the planning exercise;
 - (d) the particulars and schedule for any additional formal public consultation opportunities;

- (e) the method by which the public may obtain additional information on the planning exercise;
- (f) a request for comments;
- (g) the names of appropriate contact people;
- (h) a brief explanation of how comments received will be handled under relevant provisions of the *Freedom of Information and Protection of Privacy Act*; and
- (i) a statement on the relevant opportunities for bump-up.

TIMING AND CONTENTS OF NOTICES WITH RESPECT TO OPERATIONAL MATTERS

C: Notices for Annual Work Schedules:

1. The Notice of Annual Work Schedule Inspection shall be issued at least 15 days before operations are scheduled to commence, and shall contain:
 - (a) a statement that the approved Annual Work Schedule is available for inspection at the district office, and that the Annual Work Schedule (and any subsequent revisions to the Annual Work Schedule) shall be available throughout the 12 months covered by the schedule;
 - (b) a map of the forest management unit for which the Annual Work Schedule will be prepared, containing sufficient detail to allow for identification of the forest management unit;
 - (c) a brief description of the timber management activities to be carried out that year, with particular mention of any specific projects which involve prescribed burns or aerial applications of herbicides or insecticides;
 - (d) a statement that a mapped summary of the operations which are scheduled is available on request from the district office; and
 - (e) the names of appropriate contact people.

D. Notices for Prescribed Burns and Notices for Applications of Pesticides:

1. (a) For each project involving the aerial application of herbicides or insecticides, a public notice shall be issued at least 30 days prior to the anticipated date of application. The contents of the notice shall be similar to those used for Annual Work Schedules, with whatever modifications are necessary in the circumstances. For projects involving the aerial application of insecticides, the Notice of Insect Pest Management Program Inspection may serve as this notice of operations.

- (b) For each project involving the aerial application of herbicides or insecticides, an additional public notice shall be issued at least 7 days prior to the anticipated date of application.
 - (c) In addition, all pesticide spray blocks on Crown Land shall be posted not more than 7 days before operations commence at all reasonable points of access and at known locations within or adjacent to the spray block where water is obtained for human consumption. Signs shall remain in place for at least 30 days after the completion of the project, and shall clearly advise the public of the specific product or formulation used in that operation. Signs shall be provided in English, French and Ojicree. Signs shall indicate the date spraying occurs, the chemical used, the date when affected berries can again be consumed and the telephone number of a ministry contact person who can provide more information.
2. For each project involving a prescribed burn, a public notice shall be issued not more than 30 days before the anticipated date of the project. The contents of the notice shall be similar to those used for Annual Work Schedules, with whatever modifications are necessary in the circumstances.

NOTICES IN PUBLIC PRINT MEDIA

E: Notices for Timber Management Plans, Contingency Plans, Amendments and Insect Pest Management Programs:

1. Notices published in public print media for Timber Management Plans, Contingency Plans, amendments and insect pest management programs shall normally contain the following information, in concise non-technical language:
- (a) a statement of the purpose of the notice;
 - (b) a map of the relevant forest management unit/district;
 - (c) a description of the subject matter of the planning exercise;
 - (d) the schedule for any additional formal public consultation opportunities;
 - (e) the method by which the public may obtain additional information on the planning exercise;
 - (f) a request for comments;
 - (g) the names of appropriate contact people;
 - (h) a brief explanation of how comments received will be handled under relevant provisions of the *Freedom of Information and Protection of Privacy Act*; and
 - (i) a statement on the relevant opportunities for bump-up.

F: Notices for Annual Work Schedules:

1. Notices published in public print media for Annual Work Schedules shall normally contain the following information, in concise non-technical language:
 - (a) a statement that the approved Annual Work Schedule is available for inspection at the district office throughout the 12 months covered by the schedule;
 - (b) a map of the forest management unit that will allow the public to identify its location relative to adjacent management units;
 - (c) a brief description of the timber management activities to be carried out that year;
 - (d) a statement that a mapped summary of the operations which are scheduled is available on request from the district office; and
 - (e) the names of appropriate contact people.

APPENDIX 4: INFORMATION AVAILABLE FOR PUBLIC CONSULTATION**INFORMATION AVAILABLE WITH RESPECT TO TIMBER MANAGEMENT PLANNING****A: Timber Management Plans:****1. Stage One: Invitation to Participate and Native Community Meeting:**

The following information shall be available when the Invitation to Participate is issued:

- (a) Background information about the forest management unit:
 - (i) the current version of the values map (or maps) for the forest management unit;
 - (ii) a list of references to the sources of the information which is summarized on the values map (or maps) or otherwise available in the data base; identification of the methodologies used for data collection; and identification of those subjects for which data are recognized as being incomplete or missing;
 - (iii) a list of references to the sources of the information used to update the current Forest Resource Inventory data; and
 - (iv) the draft Native Background Information Report.
- (b) Results of preliminary analysis concerning the following subjects:
 - (i) the draft Report on Past Forest Operations;
 - (ii) objectives, strategies, problems and issues for timber and non-timber values;
 - (iii) Silvicultural Ground Rules;
 - (iv) Maximum Allowable Depletion;
 - (v) eligibility criteria for harvest, renewal and tending operations for the 20-year period of the Timber Management Plan, and associated "eligibility maps"; and
 - (vi) selection criteria for harvest, renewal and tending operations during the five-year term of the Timber Management Plan.

- (c) Other relevant documents:
 - (i) the Reports of Past Forest Operations for the previous three Timber Management Plans for the forest management unit;
 - (ii) a copy of the current Timber Management Plan for the forest management unit, and copies of all Annual Work Schedules and Annual Reports with respect to the current Timber Management Plan which have been prepared to date;
 - (iii) a list of current audits or reports prepared by or for MNR pertaining to the forest management unit (e.g. FMA Fifth-Year Reviews), and audits or reports prepared by or for MNR pertaining to forestry generally in the Province (e.g. Annual Report on Timber Management and State of the Forest Report which are described in Conditions 82 and 84 respectively), and a copy of each of those audits or reports;
 - (iv) other relevant planning documents (e.g. District Land Use Guidelines, District Fisheries Management Plans), policies, agreements, and any other relevant information available with respect to existing management objectives for non-timber values in the geographical area of the forest management unit;
 - (v) a list of MNR's implementation manuals and a copy of each of those manuals; and
 - (vi) copies of MNR's brochure on public consultation in timber management planning and the brochure described in Condition 91.
- (d) In the material displayed at the district office, MNR shall include a request for additional information relating to natural resource features, land uses and values which potentially could be affected by timber management activities, where such information is not displayed on the values map. In addition, identification and means of contacting planning team members and Local Citizens Committee members will be provided.
- (e) In addition to the draft Native Background Information Report, all of the foregoing information shall be available for the first native Community Meeting, with whatever modifications are necessary in the circumstances.

2. Stage Two: First Information Centre and Native Consultation Forum for Review of Preliminary Report on Protection of Identified Native Values:

At the First Information Centre the most current versions of the background information listed in Appendix 4, part A, section 1(a) and all other relevant documents listed in Appendix 4, part A, section 1(c) shall be available. In addition, the following information shall be available to the public:

- (a) a Preliminary Plan Summary presenting highlights of the Report of Past Forest Operations and preliminary versions of the following sections of the Timber Management Plan Summary, Appendix 11, section 1:
 - (i) a map of the forest management unit for which the Timber Management Plan will be prepared, containing sufficient detail to allow for identification of the forest management unit,
 - (ii) a general description of the forest,
 - (iii) description of management responsibilities (i.e. FMA, Crown or Company Management Unit), and a description of the forest industry supplied from the management unit,
 - (iv) LCC summary report,
 - (v) names of the district manager, Plan author and all members of the Local Citizens Committee,
 - (vi) consultation schedule,
 - (vii) comment form, and
 - (viii) bump-up notice;
- (b) analysis of information concerning the following subjects:
 - (i) Report of Past Forest Operations,
 - (ii) objectives, strategies, problems and issues for timber and non-timber values,
 - (iii) Maximum Allowable Depletion,
 - (iv) Silvicultural Ground Rules;
- (c) eligibility criteria for harvest, renewal and tending operations for the 20-year period of the Plan, and associated "eligibility maps";
- (d) the Preliminary Report on Protection of Identified Native Values (where required);
- (e) any public comments and submissions received to date and any responses to those comments and submissions;
- (f) In the material displayed at the Information Centre, MNR shall include a a request for additional information relating to natural resource features, land uses and values which potentially could be affected by timber management

activities, where such information is not displayed on the values map. The district manager, the Plan author, the planning team, and representatives from the Local Citizens Committee shall attend the Information Centre, and will be so identified;

- (g) In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, in addition to the Preliminary Report on Protection of Identified Native Values, all of the foregoing information shall be available, with whatever modifications are necessary in the circumstances;
- (h) selection criteria for harvest, renewal and tending operations during the five-year term and associated preliminary "areas selected for operations maps."
- (i) the harvest, renewal and tending program for the five-year term of the Plan;
- (j) evaluation of alternatives for:
 - (i) each primary access road which will be required for the 20-year period of the Plan;
 - (ii) each primary and secondary access road which will be required for the five-year term of the Plan; and
 - (iii) operational prescriptions for Areas of Concern.
- (k) a mapped summary of the proposed areas of operations and alternative road corridors specified in Appendix 3, part A, section 2(a)(v), a mapped summary of past and proposed harvest operations and alternative road corridors pursuant to Condition 18 and a mapped summary of ranked areas proposed for harvest pursuant to Condition 34. This map or maps shall be in summary form for the public to take home.

3. Stage Three: Second Information Centre and Native Consultation Forum for Review of Final Report on Protection of Identified Native Values:

- (a) At the Second Information Centre, the following information shall be available:
 - (i) the draft Timber Management Plan, and accompanying Supplementary Documentation;
 - (ii) the MNR preliminary list of required alterations;
 - (iii) the Final Report on Protection of Identified Native Values; and
 - (iv) the Draft Plan Summary, to be distributed to all who attend.

- (b) In addition, other relevant information shall be available, including the information described in Appendix 4, part A, sections 1(a) and (c).
- (c) The district manager, the Plan author, the planning team, and representatives from the Local Citizens Committee shall attend the Information Centre, and will be so identified.
- (d) In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, in addition to the Report on Protection of Identified Native Values, all of the foregoing information shall be available, with whatever modifications are necessary in the circumstances.

4. Stage Four: Plan Inspection

The following information shall be available when the Notice of Plan Inspection is issued:

- (a) the approved Timber Management Plan, and accompanying Supplementary Documentation;
- (b) the summary of the approved Timber Management Plan; and
- (c) a list of major changes to the draft Plan, to be distributed to all who attend.

B: Contingency Plans, Amendments and Insect Pest Management Programs:

1. Information available for public review during planning for Contingency Plans and amendments to Timber Management Plans (as described in Condition 66; Appendix 12 and Condition 67; Appendix 13 respectively) shall be comparable to the information available at similar stages for Timber Management Plans, with whatever modifications are necessary in the circumstances.
2. Information available for public review during planning for insect pest management programs which include proposals for projects involving aerial application of insecticides (as described in Appendix 14) shall include:
 - (a) Stage One: Information Centre:
 - (i) insect infestation map(s) and population forecasts;
 - (ii) maps of areas eligible for insect pest management;
 - (iii) the most current values map(s) for the affected forest management units in the District;
 - (iv) the evaluation of management options (described in Appendix 14);

- (v) the selected course of action, with reasons;
 - (vi) draft project proposals for specific aerial insecticide projects, and associated maps (described in Appendix 17);
 - (vii) the results of the insect pest management program in the area for the same insect species in the previous year (if any).
- (b) Stage Two: Insect Pest Management Program Inspection:
- (i) for specific aerial insecticide projects, the approved project descriptions and project plans (described in Appendix 17); and
 - (ii) In addition, other relevant information shall be available, including the information described in Appendix 4, part B, sections 2(a)(i)-(v) and (vii).

INFORMATION AVAILABLE WITH RESPECT TO OPERATIONAL MATTERS

C: Annual Work Schedules:

1. At the time of issuance of the Notice of Annual Work Schedule Inspection, the following information shall be available:
 - (a) the approved Annual Work Schedule, including any completed project descriptions and project plans for aerial applications of herbicides and insecticides and operational plans for prescribed burns, and
 - (b) a mapped summary of the operations which are scheduled during the 12 months covered by the Annual Work Schedule.

D. Prescribed Burns and Aerial Applications of Herbicides and Insecticides:

1. At the time of issuance of the first public notice of an aerial herbicide or insecticide project (described in Appendix 3, part D, section 1(a)), the project description and project plan for the project shall be available.
2. At the time of issuance of the second public notice of an aerial herbicide or insecticides project (described in Appendix 3, part D, section 1(b)), the project description and project plan for the project, and the project approval from the Ministry of Environment and Energy (*The Pesticides Act*, Form 5), shall be available.
3. At the time of issuance of the public notice for a prescribed burn (described in Appendix 3, part D, section 2), the operational plan for the project shall be available.

APPENDIX 5: BACKGROUND INFORMATION:**A: Pre-Planning Component****1. Background Information**

In addition to the requirements of Conditions 15 and 16 background information shall be assembled and analyzed for each MNR District by each MNR district office (with the assistance of regional staff and the Plan author), and shall include but not be limited to:

- (a) Provincial Goals and Objectives for the Resource Management Programs in Ontario;
- (b) Main Provincial Policies for resource management programs;
- (c) Regional Objectives and Targets for resource management programs;
- (d) District and Management Unit Objectives and Targets;
- (e) Existing approved resource plans;
- (f) Provincial Guidelines and other Implementation Manuals;
- (g) Past Forest Management Audits;
- (h) Recommendations of the Advisory Committees referred to in Condition 4;
- (i) Other relevant information.

2. District Manager Responsibilities

- (a) Each MNR district manager shall, in conjunction with the regional staff, ensure that the following types of information for each management unit, where available, be provided to the planning team for analysis and review:
 - (i) Moose Population and Habitat Surveys;
 - (ii) Deer Population and Habitat Surveys;
 - (iii) Fisheries Data;
 - (iv) Lake and Aquatic Surveys;
 - (v) Soil Surveys;
 - (vi) Forest Ecosystem Classification;

- (vii) Identified and Verified Values;
 - (viii) Other relevant information.
 - (b) Each MNR district manager shall prepare a values map for the planning team.
 - (c) Each MNR district manager shall prepare a brief statement outlining the resource management targets and the success of meeting or movement towards achievement of the targets. Significant problems and issues would be identified and proposed strategies to address specific problems or issues would be presented in summary.
3. Plan Author Responsibility
- (a) The Plan author, in conjunction with the planning team, shall assemble and analyze the information pertaining to the timber resource data base. The following information shall be assembled and analyzed:
 - (i) Administration and Physical Description;
 - (ii) Forest Resource Inventory;
 - (iii) Forest Unit Rotation or Cutting Cycle;
 - (iv) Calculation of the Maximum Allowable Depletion;
 - (v) Silvicultural Groundrules and Operational Prescriptions;
 - (vi) Eligibility Criteria for Depletion, Renewal and Maintenance.

B: Values Map Content:

1. A "values map" is a representation in summary form of the geographical location of the known natural resource features, land uses and values which must be considered in timber management planning, and about which further inventory information is available. The types of information portrayed on the values map (or maps) will normally include, but are not limited to, the following, where such values have been identified by MNR, the forest industry or by any other person and are verifiable:
 - (a) Natural Resource Features
 - (i) Fisheries
 - major fish communities by lake/stream
 - bait fish lakes
 - spawning areas
 - nursery areas

- migration areas
- headwater lakes
- food supply areas
- (ii) Wildlife
 - moose concentration areas (early & late winter)
 - aquatic feeding areas
 - mineral licks
 - calving sites
 - deer wintering areas (yards)
 - raptor (i.e. eagle/osprey) nests
 - heronries
 - waterfowl nesting areas
 - important habitats of rare, threatened, and endangered species*
 - caribou migration routes
 - caribou calving areas
 - caribou wintering areas
- (iii) Areas of Natural and Scientific Interest, including Candidate Areas of Natural and Scientific Interest (ANSIs)
- (iv) Significant communities of flora/fauna including candidate old growth red and white pine forest communities
- (v) Classified wetlands (S. Ontario)
- (vi) Provincially significant wetlands (N. Ontario)
- (vii) Forests
 - tree improvement areas
 - seed orchards
 - seed collection areas
 - genetic test areas
 - research plots (e.g. provenance test areas)
- (b) **Forest Resource Uses/Values**
 - (i) Tourism Establishments
 - main base lodges
 - outpost camps
 - commercial boat caches
 - potential tourism areas
 - (ii) Cottaging/Residential Sites or Areas
 - existing development
 - proposed development (from lakeshore management plans)
 - remote cottage sites

- (iii) Mineral/Aggregate/Quarry Development
 - pit or quarry permits/licenses
 - active mining claims
- (iv) Commercial Fur
 - registered trapline areas
 - trapper cabins
- (v) Wild Rice Production Areas
- (vi) Crown Land Recreation
 - access points
 - canoe routes
 - portage trails
 - hiking/nature trails
 - snowmobile trails
 - cross-country ski trails
 - approved boat caches
 - land use permit hunt camps
- (c) **Existing and Planned Infrastructure Features such as:**
 - roads and railways
 - utilities (pipelines, hydro lines)
 - waste and sewage disposal sites
 - potable water supply sources, including sites on lakes, rivers and streams identified by any person as being used for water supplies
 - communications towers
 - airports/airstrips
 - logging camps
 - mills
- (d) **Cultural Heritage Sites such as:***
 - cultural landscapes
 - structural remains
 - archaeological remains
 - traditional use sites
- (e) **Other Special Land Uses of Local Significance as identified by any person, such as:**
 - areas of significance to local communities such as areas used for traditional or recreational activities;
 - boundaries of registered trapline areas;
 - Reserves and other native communities;
 - areas which have been identified as being required as reserve lands or for economic or capital development projects;
 - areas used for fuelwood or building materials;

- sites of local archaeological, historical, religious and cultural heritage significance, including native graveyards, spirit sites and burial sites.*
- medicinal plants

(f) Exclusions from the Land Base of the Forest Management Unit including:

- patented lands
- Federal lands (e.g. Indian Reserves, Department of National Defence Bases, National Parks)
- provincial parks and approved provincial park candidates
- Crown land leases (i.e. land use permits, licenses of occupation)
- cemeteries/burial grounds, including native cemeteries and burial grounds*
- Areas of Natural and Scientific Interest which have been designated as exclusions from the forest management unit

*** PUBLICIZING THE LOCATION OF CERTAIN VALUES MAY BE DETRIMENTAL TO CONSERVATION IN WHICH CASE INFORMATION WOULD NOT NORMALLY BE SHOWN ON THE VALUES MAP.**

APPENDIX 6: NATIVE BACKGROUND INFORMATION REPORT

1. The Native Background Information Report shall contain:
 - (a) a summary of past utilization of the timber resource by those native communities;
 - (b) a summary of past utilization of other resources by those native communities, in particular traditional and commercial hunting, fishing, trapping and gathering;
 - (c) a native values map and listing which identifies the location of specific natural resource features, land uses and values which are specifically used by, or of importance to, those native communities. In particular, the following features, land uses and values will be mapped:
 - (i) areas of significance to local native communities such as areas used for traditional or recreational activities;
 - (ii) boundaries of trapline management areas of those native communities (i.e. all registered trapline areas associated with individual native communities);
 - (iii) Reserves and other native communities;
 - (iv) areas which have been identified as being required as reserve lands or for economic or capital development projects of those native communities;
 - (v) areas used by those native communities for fuelwood or building materials; and
 - (vi) sites of local archaeological, historical, religious and cultural heritage significance to those native communities, including native graveyards, spirit sites and burial sites.*

***PUBLICIZING THE LOCATION OF CERTAIN VALUES MAY BE DETRIMENTAL TO CONSERVATION IN WHICH CASE INFORMATION WOULD NOT NORMALLY BE SHOWN ON THE NATIVE VALUES MAP.**
 - (d) a summary of timber management-related problems and issues specific to those native communities, which arose during implementation of the Timber Management Plan for the current five-year term.
2. A copy of the Native Background Information Report will be provided to the Ontario Native Affairs Secretariat.

APPENDIX 7: IMPLEMENTATION MANUALS FOR TIMBER MANAGEMENT

Implementation manuals include the following provincial guidelines, construction/operational manuals and resource/environmental manuals:

(a) Provincial guidelines:

- (i) A Silvicultural Guide to the Jack Pine Working Group in Ontario, 1986
- (ii) A Silvicultural Guide to the Spruce Working Group, 1988
- (iii) A Silvicultural Guide to the Poplar Working Group, 1989
- (iv) A Silvicultural Guide for the Tolerant Hardwoods Working Group in Ontario, 1990
- (v) A Silvicultural Guide for the White Pine and Red Pine Working Groups in Ontario, 1990
- (vi) A Silvicultural Guide for the Mixed Wood Working Group (pursuant to Condition 94(d))
- (vii) Timber Management Guidelines for the Protection of Tourism Values, 1986
- (viii) Timber Management Guidelines for the Provision of Moose Habitat, 1988
- (ix) Timber Management Guidelines for the Protection of Fish Habitat, 1988
- (x) Timber Management Guidelines for the Provision of White-tailed Deer Habitat (in preparation)
- (xi) Timber Management Guidelines for the Protection of Cultural Heritage Resources, 1991
- (xii) Timber Management Guidelines for the Provision of Pine Marten Habitat (pursuant to Condition 94(c))
- (xiii) Timber Management Guidelines for the Provision of Pileated Woodpecker Habitat (pursuant to Condition 94(c))
- (xiv) Environmental Guidelines for Timber Management Activities (pursuant to Condition 94(b))

(b) Construction/operational manuals:

- (i) Aerial Spraying for Forest Management - an Operational Manual, 1981 (Note: applies to MNR only)

- (ii) Resource Access Roads Policy and Implementation Strategies and Guidelines, 1985
 - (iii) Prescribed Burn Planning Manual, 1988
 - (iv) Environmental Guidelines for Access Roads and Water Crossings, 1988
 - (v) Code of Practice for Timber Management Operations in Riparian Areas, 1991.
- (c) Resource/environmental manuals:
- (i) Management Guidelines and Recommendations for Osprey in Ontario, June 1983
 - (ii) Habitat Management for Ontario's Forest Nesting Accipiters, Buteos, and Eagles, March 1984
 - (iii) Habitat Management Guidelines for Cavity Nesting Birds in Ontario, March 1984
 - (iv) Management Guidelines for the Protection of Heronries in Ontario, 1984
 - (v) Habitat Management Guidelines for Warblers of Ontario's Northern Coniferous Forests, Mixed Forests or Southern Hardwood Forests, March 1984
 - (vi) Habitat Management Guidelines for Bats of Ontario, August 1984
 - (vii) Habitat Management Guidelines for Birds of Ontario Wetlands including marshes, Swamps, and Fens or Bogs of various types (excluding waterfowl), March 1985
 - (viii) Bald Eagle Habitat Management Guidelines, June 1987
 - (ix) Golden Eagle Habitat Management Guidelines, November 1987
 - (x) Peregrine Falcon Habitat Management Guidelines, December 1987
 - (xi) Guidelines for Providing Furbearer Habitat in Timber Management (in preparation)
 - (xii) Habitat Management Guidelines for Woodland Caribou (in preparation)
 - (xiii) Habitat Management Guidelines for Waterfowl in Ontario (in preparation).
 - (xvi) Hawk Guide for MNR Field Personnel, 1991

APPENDIX 8: REPORT OF PAST FOREST OPERATIONS

1. The Report of Past Forest Operations shall contain the following information concerning implementation of operations on the forest management unit during the five-year term of the previous Timber Management Plan:
 - (a) Statistical information comparing planned and actual activities for the previous five-year term including:
 - (i) area harvested;
 - (ii) volume harvested;
 - (iii) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (iv) area tended and area regenerated and the spending incurred to implement these activities by treatment method including but not limited to site preparation, planting, seeding, natural regeneration and tree improvement support.
 - (v) area tended and area treated for protection purposes, by treatment method including but not limited to cleaning: manual, chemical, mechanical; spacing, thinning; stand improvement);
 - (vi) tree improvement support;
 - (vii) kilometres of primary and secondary access roads constructed and maintained, signed or physically or naturally abandoned;
 - (viii) stand listings showing the silvicultural treatment package implemented;
 - (ix) annual government revenues from the FMU for stumpage and area fees;
 - (x) merchantable and unmerchantable timber wastage by volume and species pursuant to condition 78(b)(ii); and
 - (xi) average and maximum size of clear cuts;
 - (b) a summary of areas assessed for Free to Grow status and areas declared Free to Grow shall be provided by silvicultural treatment package and upon completion of the revision of the Silvicultural Guides pursuant to Condition 94(a) by general standard site type;
 - (c) a summary of the area inspection reports for the management unit (prepared by MNR), including a description of the types of infractions encountered and actions taken during the term of the Plan, and recommendations for

- improving compliance, effects and effectiveness on the forest management unit;
- (d) a summary of the percentage of Maximum Allowable Depletion actually harvested, by forest unit or working group;
 - (e) spending for maintenance and construction of primary, secondary and other roads;
 - (f) a list of administrative, minor and major amendments, and an explanation of the reasons for the amendments;
 - (g) a summary of audit results relating to the forest management unit;
 - (h) conclusions on the success of meeting timber management objectives for the forest management unit;
 - (i) conclusions on the success of meeting non-timber management objectives for the forest management unit.
 - (j) a discussion of significant problems and issues arising during implementation of the Timber Management Plan for the previous five-year term. This discussion will include a description of any undesirable conditions which have been observed in the areas of operations for the previous five-year term, related to timber management activities;
 - (k) recommendations for the development of the timber management strategies for the next five-year term to address problems and issues identified in the Report of Past Forest Operations, and
 - (l) a statement of silvicultural effectiveness by working group and silvicultural treatment package shall be provided, and upon completion of the revision of the Silvicultural Guides pursuant to Condition 94(a) by general standard site type.

APPENDIX 9: SUPPLEMENTARY DOCUMENTATION

1. Each Timber Management Plan shall contain the following supplementary documentation:
 - (a) a list of the implementation manuals used in the preparation of the Timber Management Plan;
 - (b) a copy of the values map, current as of the date of approval of the Timber Management Plan;
 - (c) a list of references to the sources of the information which is summarized on the values map (or maps) or otherwise available in the data base; identification of the methodologies used for data collection; and identification of those subjects for which data is recognized as being incomplete or missing;
 - (d) a list of references to the sources of the information used to update the current Forest Resource Inventory data;
 - (e) a summary of public consultation in the preparation of the Plan;
 - (f) a report from the Local Citizens Committee concerning its activities during Plan preparation; the problems and issues addressed by the Committee; an assessment of the effectiveness of the committee structure; and recommendations for change, if any;
 - (g) a summary of the major issues encountered and addressed in the Plan including any significant disagreements among planning team members on major issues;
 - (h) any documentation produced in accordance with the issue resolution procedures described in Condition 64;
 - (i) any documentation produced in accordance with the Plan review and approval process as described in condition 62;
 - (j) documentation of the planning of operational prescriptions for "Areas of Concern";
 - (k) the Plan author's summary of the Report on Past Forest Operations and proposed future direction;
 - (l) a listing of stands allocated for depletion, including:
 - (i) total area and volume allocated;

- (ii) area allocated for normal operations and the associated silvicultural package;
 - (iii) area allocated for modified operations, including AOCs, and the associated silvicultural package; and
 - (iv) area allocated as reserves;
 - (m) documentation of the planning of primary and secondary access road corridors, the locations of primary and secondary roads in Areas of Concern, and conditions on tertiary roads in Areas of Concern;
2. The foregoing supplementary documentation will accompany both the draft and approved Timber Management Plans, with whatever modifications are necessary in the circumstances.

APPENDIX 10: REPORT ON PROTECTION OF IDENTIFIED NATIVE VALUES**Preliminary Report on Protection of Identified Native Values:**

1. In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, during the development of the Timber Management Plan, the planning team shall produce a Preliminary Report on Protection of Identified Native Values. The Report shall consist of the following components:
 - (a) a mapped summary of the proposed areas of operations and alternative road corridors;
 - (b) the most current updated versions of the values map and the native values map;
 - (c) an evaluation of alternative prescriptions for specific Areas of Concern associated with the native values identified in the Native Background Information Report affected by the anticipated operations for the five-year term;
 - (d) an evaluation of the alternative road corridors of potential interest to the native community; and
 - (e) a comment sheet and the name of a native community contact person and an MNR contact person.

Final Report on Protection of Identified Native Values:

2. In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, upon completion of the draft Timber Management Plan, the planning team shall produce a Final Report on Protection of Identified Native Values. The Report shall consist of the following components:
 - (a) the summary of the draft Timber Management Plan;
 - (b) the most current updated versions of the values map and the native values map;
 - (c) in order to communicate the results of previous consultation, the selected prescriptions for the specific Areas of Concern associated with the native values identified in the Preliminary Report on Protection of Identified Native Values; the reasons for the selected prescriptions; and any associated MNR preliminary required alterations; and
 - (d) the selected road locations of potential interest to the native community, reasons for the selected locations and use management strategies; and any associated MNR preliminary required alterations.

3. Copies of both the Preliminary and Final Report on Protection of Identified Native Values will be provided to the Ontario Native Affairs Secretariat.

APPENDIX 11: TIMBER MANAGEMENT PLAN SUMMARY

1. The text of the Timber Management Plan Summary shall include the following items, and shall provide references to the appropriate sections of the Plan for each item:
 - (a) a map of the forest management unit for which the Timber Management Plan is prepared, containing sufficient detail to allow for identification of the location of the forest management unit;
 - (b) a general description of the forest;
 - (c) a description of the management responsibilities for the management unit (i.e. FMA, Crown or Company Management Unit), and a description of the forest industry being supplied from the management unit;
 - (d) highlights of the Local Citizens Committee summary, especially its criticism, to be prepared and approved by the LCC.
 - (e) a summary of the objectives and strategies for the management of the timber resource of the forest management unit;
 - (f) a summary of the existing management objectives for the non-timber values of the forest management unit which could be affected by timber management activities, and the timber management strategies intended to assist in meeting those non-timber objectives;
 - (g) a summary description of the silvicultural prescriptions commonly used on the management unit;
 - (h) a summary description of the results of the Maximum Allowable Depletion calculations, and the percentage of the Maximum Allowable Depletion(s) which is planned for harvest;
 - (i) a summary of the major issues encountered and addressed in the Plan including any significant disagreements among planning team members on major issues;
 - (j) the names of the district manager, Plan author, and all members of the Local Citizens Committee;
 - (k) the schedule for any remaining formal public consultation opportunities;
 - (l) a comment form; and
 - (m) a statement that there is an opportunity at any time during the timber management planning process to make a request to the Minister of Environment and Energy for a bump-up of specific proposed timber management activities to the status of an individual environmental assessment.

2. A mapped summary of the operations planned for the five-year term of the Timber Management Plan shall also be produced, to assist in public review of the Timber Management Plan. The map will be prepared at a suitable scale to allow for appropriate resolution of the information and for ease of reproduction. The map will be available for distribution to the public at Stage Three and Stage Four of the public consultation process coinciding with the Draft and Approved Plans, with whatever modifications are necessary in the circumstances.
3. The Timber Management Plan summaries for the public shall be produced for both the draft Plan at the Second Information Centre and for the approved Timber Management Plan, with whatever modifications are necessary in the circumstances.

APPENDIX 12: CONTINGENCY PLANS

A "Contingency Plan" is an interim Timber Management Plan which is required if a Timber Management Plan cannot be prepared and approved by the required date. In cases where a Contingency Plan is required, the following procedure shall apply.

1. To initiate the planning process for a Contingency Plan, MNR shall submit a planning proposal to the Director of the Environmental Assessment Branch, Ministry of Environment and Energy. A copy of the proposal will also be provided to the appropriate regional office of the Ministry of Environment and Energy. The proposal shall describe:
 - (a) the need for a Contingency Plan;
 - (b) the proposed contents of the Contingency Plan;
 - (c) the proposed period of time to be covered by the Contingency Plan;
 - (d) a schedule for its production, review and approval; and
 - (e) the recommendations, if any, of the Local Citizens Committee.

Upon endorsement of the planning proposal by the Director of the Environmental Assessment Branch, Ministry of Environment and Energy, production, review and approval of the Contingency Plan will proceed.

2. The schedule for the preparation of the Contingency Plan shall include provisions for public consultation. The formal public consultation provisions will be dependent upon the degree to which proposed operations have already been subjected to public review in the timber management planning process. At a minimum, the Local Citizens Committee shall be consulted in the design and implementation of any Contingency Plan, if possible.
3. At a minimum, a Notice of Contingency Plan Inspection shall be issued at least 15 days before operations are scheduled to proceed. Requirements for service of this Notice are listed in Appendix 2, part B. The timing and contents of the Public Notice are listed in Appendix 3, part B. Details of the minimum information available are listed in Appendix 4, part B, section 1.
4. A copy of the approved Contingency Plan shall be filed in the same locations as approved Timber Management Plans (as provided in Condition 65), and provided to the appropriate regional office of the Ministry of Environment and Energy.

APPENDIX 13: AMENDMENTS TO TIMBER MANAGEMENT PLANS

An "amendment" is a change to an approved Timber Management Plan during its five-year term. In cases where an amendment to an approved Timber Management Plan has been requested, the following procedure shall apply.

Categorizing Amendments:

1. In determining whether planning for the amendment should proceed, and if so the appropriate category of amendment, the district manager shall, in consultation with the Local Citizens Committee, assess the extent of public consultation and formal MNR review and approval which is required, in light of the particular circumstances of the proposal and record the Local Citizens Committee's disagreements with the categorization of amendments. This decision will normally be made within 15 days of the receipt of the request.
2. In determining whether planning for the amendment should proceed, and if so the appropriate category of amendment, the following factors shall be considered:
 - (a) whether there are legitimate time constraints which must be met for reasons of public safety, biological necessity, industrial necessity, or public convenience and necessity;
 - (b) whether there has been previous notification that the requested amendment will be required, and the degree to which planning and public consultation has taken place previously (eg. decisions deferred in the Timber Management Plan; amendments required after public consultation in other planning processes);
 - (c) the adequacy of the information concerning the resource features, land uses and values potentially affected and the anticipated potential effects of the requested operations; and
 - (d) the number of previous requests for similar amendments.

Salvage Operations:

3. Where salvage operations are feasible as a result of a natural catastrophe the district manager in consultation with the Local Citizens Committee may take such steps as are necessary to facilitate the expeditious planning and implementation of such operations to avoid waste.

Administrative Amendments:

4. Where the district manager decides that the amendment should proceed, and that the appropriate category of amendment is "administrative", the district manager shall approve the amendment when the necessary planning has been completed.

Minor Amendments:

5. Where the district manager decides that the amendment should proceed, and that the appropriate category of amendment is "minor", the district manager shall direct the necessary planning and review of the proposed amendment to proceed.

Public Consultation in the Preparation of Minor Amendments:

6.
 - (a) One formal public consultation opportunity shall be provided in the timber management planning process for minor amendments, in the form of a Notice of Minor Amendment Inspection. This Notice shall be issued at least 15 days prior to a final decision on approval, and shall provide direction on how to obtain access to the amendment documentation. The purpose of this public consultation opportunity is to provide a formal opportunity for the public to determine whether they have concerns about the amendment.
 - (b) Requirements for service of this Notice are listed Appendix 2, part B. The timing and contents of the Public Notice are listed in Appendix 3, part B. Details of the minimum information available are listed in Appendix 4, part B, section 1.
7.
 - (a) Where the response to the Public Notice indicates no significant concerns, or where any concerns received can be resolved with no substantial change to the proposed amendment, the district manager shall approve the amendment.
 - (b) Where the response to the Public Notice indicates significant unresolved concern about the proposed amendment, the amendment request shall be re-categorized as "major", unless the district manager, with the concurrence of the regional director, determines that the objection is unreasonable or that the amendment is a matter of urgency.

Major Amendments:

8. Where the district manager decides that the amendment should proceed and that the appropriate category of amendment is "major", the district manager shall direct the necessary planning of the proposed amendment to proceed.

Public Consultation in the Preparation of Major Amendments:

9. Formal public consultation opportunities shall be provided at two stages in the timber management planning process for major amendments. These opportunities include an option for native communities who have chosen additional consultation and documentation opportunities in the preparation of the Timber Management Plan to continue the Timber Management Native Consultation Program for the major amendment.
10. Public Notices shall be issued at each stage of the public consultation process. Requirements for service of these Notices are listed in Appendix 2, part B. The

timing and contents of the Public Notices are listed in Appendix 3, part B. Details of the minimum information available at each stage of the public consultation process are listed in Appendix 4, part B, section 1.

11. (a) Stage One of the public consultation process for major amendments shall commence with the issuance of a Notice an Information Centre. This Information Centre shall be held during the development of proposals for the major amendment to the Timber Management Plan. The purpose of this public consultation opportunity is to provide a formal opportunity for public comment on the assembly and analysis of background information and the evaluation of alternatives; to generate additional alternatives for consideration; and to request additional contributions to the information base and other information to be considered in decision-making; and to advise the public that a request may be made to the Minister of Environment and Energy for a bump up of the major amendment to individual environmental assessment status.
 - (b) (i) Timber Management Native Consultation Program: In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, at the time of issuance of the Notice an Information Centre, a Preliminary Report on Protection of Identified Native Values (described in Condition 57) shall be provided to the native community. A Notice shall be issued to the native community advising of the agreed forum for consideration of the Report. The purpose of this stage of consultation is for the community to comment on the Report and all other analysis of background information and evaluation of alternatives for the Plan; to generate additional alternatives for consideration; and to provide information on the native communities' preferred alternatives;
 - (ii) Where a native community has chosen to participate in the standard public consultation process, MNR shall, with whatever modifications are necessary, arrange a special Information Centre at a location convenient to that community, upon request.
12. After completion of public review, the proposed amendment shall be finalized and submitted to the regional director for approval.
13. (a) Stage Two of the public consultation process for major amendments shall commence with the issuance of a Notice of Major Amendment Inspection. This notice shall be issued upon MNR approval of the major amendment, and shall provide direction on how to obtain access to the amendment documentation. The purpose of this public consultation opportunity is to advise the public that the amendment has been approved, and to provide a formal opportunity for the public to examine the results of the planning process.

- (b) Timber Management Native Consultation Program: In those cases where the native community has chosen to be involved in the Timber Management Native Consultation Program, at the time of issuance of the Notice of Major Amendment Inspection, a Final Report on Protection of Identified Native Values (described in Condition 57) shall be provided to the native community. The purpose of this stage of consultation is to advise the native community that the amendment has been approved, and to provide a formal opportunity for the community to examine the results of the planning process.

Access to Amendment Documentation:

- 13. All approved amendments shall form part of the Timber Management Plan. A copy of the approved amendment and the accompanying supplementary documentation shall be filed in the same locations as approved Timber Management Plans (as provided in Condition 65), and provided to the appropriate regional office of the Ministry of Environment and Energy.

APPENDIX 14: PLANNING FOR INSECT PEST MANAGEMENT PROGRAMS

When programs for insect pest management are required, the following planning procedure shall apply.

1.
 - (a) Multi-disciplinary District and Regional Committees will be established to produce a District insect pest management program. A member of the Local Citizens Committee shall be invited to serve on the district multi-disciplinary committee.
 - (b) Areas eligible for insect pest management will be identified.
 - (c) For the areas eligible for insect pest management, there shall be consideration of the following management options:
 - (i) no treatment;
 - (ii) accelerated harvest operations;
 - (iii) redirected harvest operations;
 - (iv) salvage operations;
 - (v) use of insecticides; and
 - (vi) appropriate combinations of the foregoing options.
 - (d) There shall be an evaluation of each management option which shall be documented, and consist of:
 - (i) an assessment of the advantages and disadvantages of that management option for timber management purposes;
 - (ii) an assessment of the advantages and disadvantages of that management option as they relate to potential effects on non-timber values identified in the areas eligible for insect pest management; and
 - (iii) a discussion of the anticipated effectiveness of the option, and an estimate of the operational costs related to that management option.
 - (e) The selection of the specific course of action shall be based on a comparison of the evaluations of management options. The reasons for the selection of the specific course of action shall be provided.
 - (f) When considering the use of insecticides, where alternatives to chemical insecticides are commercially available, reasonably cost-effective, and approved federally and provincially for use, the Ministry will use such alternatives in preference to chemical insecticides.

2. Where the selected course of action involves accelerated harvest, re-directed harvest or salvage, the district manager shall determine whether an amendment to the approved Timber Management Plan is required. In such cases, the procedure outlined in Appendix 13 shall apply.
3.
 - (a) Where the selected course of action involves the aerial application of insecticides, formal public consultation opportunities shall be provided at two stages in the preparation of specific project proposals for the insect pest management program.
 - (b) Public Notices shall be issued at each stage of the public consultation process. Requirements for the service of these Notices are listed in Appendix 2, part B. The timing and contents of the Public Notices are listed in Appendix 3, part B. Details of the minimum information available at each stage of the public consultation process are listed in Appendix 4, part B, section 2.
4.
 - (a) Stage One of the public consultation process for the preparation of specific project proposals for an insect pest management program shall commence with the issuance of a Notice of an Information Centre. The purpose of this public consultation opportunity is to provide a formal opportunity for public review and comment on the proposed insect pest management program and specific proposals for insect pest management projects, before decisions are made.
 - (b) MNR shall, with whatever modifications are necessary, arrange a special Information Centre at a location convenient to local native communities, upon request.
5. After completion of public review of the project proposals for the insect pest management program, specific project descriptions shall be prepared and submitted for approval.
6. Stage Two of the public consultation process for the preparation of specific project proposals for an insect pest management program shall commence with the issuance of a Notice of Insect Pest Management Program Inspection. This notice shall be issued upon MNR approval of the program, and shall provide direction on how to obtain access to the insect pest management program documentation. The purpose of this public consultation opportunity is to advise the public that the insect pest management program has been approved, and to provide a formal opportunity for the public to examine the results of the planning process. In addition, this notice may serve as the notice of operations (described in Appendix 3, part D, section 1(a)) for projects involving the aerial application of insecticides.

APPENDIX 15: BUMP-UP PROCEDURE

1. The bump-up procedure may be initiated at any time during the planning process, but not later than 30 days following the final public notice with respect to each Timber Management Plan, each major amendment to an approved Timber Management Plan, and each program for insect pest management.
2. Any person who has a concern with respect to specific proposed timber management activities may initiate the bump-up procedure by requesting the Minister of Environment and Energy to direct MNR to undertake an individual environmental assessment of those activities. The request shall be in writing, and shall describe the nature of the concern and the reasons for the request. The Ministry of Environment and Energy shall provide a copy of the request to the Minister of Natural Resources, the MNR district manager and the Plan author immediately upon receipt of the request.
3. The Minister of Environment and Energy shall consider the request and before making his decision, shall provide specific notice to the Minister of Natural Resources to respond to the bump-up request within 15 days. The decision of the Minister of Environment and Energy will normally be made within 45 days after the last opportunity to make a bump-up request. In the case of insect pest management programs which include proposals for projects involving aerial application of insecticides, the decision of the Minister of Environment and Energy will normally be made within 30 days of the receipt of the response from the Ministry of Natural Resources and if this deadline cannot be met the Minister of Environment and Energy shall provide the reason for the delay to the Minister of Natural Resources, the MNR district manager, the Plan author and the person requesting the bump-up.
4. If a bump-up is requested while planning is ongoing, the planning exercise may proceed while the Minister of Environment and Energy considers the request.
5. If the Minister of Environment and Energy does not agree to the bump-up request, the Minister shall give written notice to the Minister of Natural Resources, the MNR district manager, the Plan author and the person requesting the bump-up that the request has been refused, together with reasons for the refusal.
6. If the Minister of Environment and Energy agrees to the bump-up request, the Minister shall give written notice to the Minister of Natural Resources, the MNR district manager, the person requesting the bump-up and the Plan author (where appropriate) that MNR will be required to prepare and submit an individual environmental assessment for review and approval under the *Environmental Assessment Act*, R.S.O. 1990, c. E.18. The specific timber management activities, and the areas of the management unit which are affected by the approved bump-up request shall be identified. In such circumstances, planning may continue and partial or conditional approval of activities may be granted by MNR, in respect of activities and areas unaffected by the approved bump-up request, with the concurrence of the Director of the Environmental Assessment Branch, Ministry of Environment and Energy.

7. Where there remains an outstanding bump-up request to the Minister of Environment and Energy at the time that activities are scheduled for implementation, partial or conditional approval of activities may be granted by MNR, upon notice to the bump-up requestor and with the concurrence of the Director of the Environmental Assessment Branch, Ministry of Environment and Energy, to permit appropriate operations to proceed in respect of activities and areas unaffected by the outstanding request.

APPENDIX 16: PRESCRIBED BURNS

1. For each prescribed burn, an operational plan shall be prepared in accordance with the procedures set out in the Prescribed Burn Planning Manual, as amended from time to time, and will include:
 - (a) the description of the methods which will be used to notify the public (i.e. a communications plan). Minimum requirements for service of this Notice are listed in Appendix 2, part D. The timing and contents of the Public Notice are listed in Appendix 3, part D. Details of the minimum information available are listed in Appendix 4, part D, section 3;
 - (b) clear statements of the objectives to be achieved;
 - (c) a prescription described in forest fire danger rating terms of the weather and fuel conditions which will result in the necessary fuel reduction in order to achieve the objectives;
 - (d) a list of all Areas of Concern within or near the prescribed burn area, and an analysis of the potential positive and negative effects of the prescribed burn on timber and non-timber values; and
 - (e) a description of the ignition, suppression, safety and support activities which will be required.
2. The operational plan shall be the subject of an MNR internal review by the District and Region. The Local Citizens Committee shall be provided the opportunity to inspect the prescribed burn operational plan prior to its approval by the district manager and the regional director.
3. Upon completion, the operational plan for each approved prescribed burn shall be appended to the Annual Work Schedule which is available for public inspection.
4. A post-burn report shall be prepared and will include:
 - (a) an assessment of the success of the burn in achieving the objectives; and
 - (b) documentation of the observable positive and negative effects of the burn, including those related to the Areas of Concern identified in the operational plan.
5. Operational plans and post-burn reports shall be retained at the district office and will be available for public inspection.

APPENDIX 17: AERIAL HERBICIDE AND INSECTICIDE PROJECTS

1. A project description shall be prepared for each aerial application of a herbicide or insecticide, and will include:
 - (a) a statement of the objectives to be achieved;
 - (b) a forest description;
 - (c) the technical name and formulation of the pesticide;
 - (d) the type of aircraft to be used (i.e. rotary or fixed wing);
 - (e) the name of the project supervisor;
 - (f) the locations of the treatment areas, identified on maps;
 - (g) the proposed timing of the activity; and
 - (h) a description of the results of the application of the MNR/MOEE Buffer Zones and their display on maps.
2. Upon completion, the project description for each aerial application of a herbicide or insecticide shall be appended to the Annual Work Schedule which is available for public inspection.
3. A project plan shall be prepared for each aerial application of a herbicide or insecticide will be prepared and will include:
 - (a) the description of the methods which will be used to notify the public (i.e. a communications plan). Minimum requirements for service of this Notice are listed in Appendix 2, part D. The timing and contents of the Public Notice are listed in Appendix 3, part D. Details of the minimum information available are listed in Appendix 4, part D, sections 1 and 2;
 - (b) an operations plan;
 - (c) a safety plan; and
 - (d) a security plan.
4. A post-operations report shall be prepared and retained at the district office, and will be available for public inspection.

APPENDIX 18: ANNUAL REPORT (FOREST MANAGEMENT UNIT)

1. The Annual Report shall contain the following information concerning implementation of operations on the forest management unit during the preceding year:
 - (a) area harvested, average and maximum size of clearcuts;
 - (b) volume harvested;
 - (c) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (d) area site prepared and area regenerated, by treatment method (eg. site preparation: mechanical, chemical, prescribed burn; natural regeneration; scarification; artificial regeneration: planting container stock, planting bare root stock, seeding);
 - (e) area tended and area treated for protection purposes, by treatment method (eg. cleaning: manual, chemical, mechanical; spacing; thinning; stand improvement);
 - (f) tree improvement support;
 - (g) kilometres of primary and secondary access roads constructed, maintained, gated, signed or physically or naturally abandoned;
 - (h) areas declared Free-to-Grow by silvicultural treatment package.
 - (i) a summary of the area inspection reports for the management unit (prepared by MNR) and a summary of the monitoring (compliance, effects and effectiveness) results as determined by an analysis of the following information, when available: Silvicultural Ground Rules; survival surveys; FTG results; stocking assessments; SOAR's; compliance monitoring results; area inspection reports; SIS, SAS; and audit results.
 - (j) government revenues from stumpage and area charges;
 - (k) spending for maintenance and construction of primary, secondary and other roads; spending for regeneration, tending and protection by treatment method.
 - (l) merchantable and unmerchantable timber wastage by volume and species pursuant to condition 78(b)(ii);
 - (m) a summary of the percentage of Maximum Allowable Depletion actually harvested, by working group;

- (n) identification of unresolved disputes over visual resource prescriptions pursuant to Condition 24;
- (o) forecast and actual spending on tending and regeneration, pursuant to Condition 38(a).

APPENDIX 19: PROVINCIAL LEVEL MONITORING: LONG-TERM SCIENTIFIC STUDIES**1. Timber Management Guidelines for the Provision of Moose Habitat**

The studies will:

- (a) assess the efficacy of the guidelines in providing moose habitat; and
- (b) recommend improvements to the guidelines.

2. Timber Management Guidelines for the Protection of Fish Habitat

The studies will:

- (a) assess the efficacy of the guidelines in protecting fish and fish habitat;
- (b) investigate the relationship between forest cover manipulation and protection of fish habitat in the Ontario situation;
- (c) apply study treatments to both lakes and streams;
- (d) include the following measurements:
 - (i) watershed mapping (e.g. boundaries of watersheds, lake bathymetry, forest mapping, fish spawning sites),
 - (ii) stream water levels and flow,
 - (iii) selected water quality parameters (e.g. phosphorus, temperature, dissolved oxygen, pH, alkalinity),
 - (iv) turbidity and major ion composition
 - (v) sediments (e.g. substrate composition in spawning areas, downstream from road water crossings), and
 - (vi) fish population characteristics; and
- (e) recommend improvements to the guidelines.

3. Timber Management Guidelines for the Protection of Tourism Values

The studies will:

- (a) assess the efficacy of the guidelines by sampling tourism operations in Northern Ontario (e.g. remote mainbase lodges, accessible mainbase lodges, outpost camps); and

- (b) recommend improvements to the guidelines.

4. Other Wildlife

The studies will:

- (a) assess the efficacy of the Timber Management Guidelines for the Provision of Moose Habitat in providing habitat for other wildlife species;
- (b) assess the efficacy of timber management practices other than those described in the Timber Management Guidelines for the Provision of Moose Habitat in providing habitat for other wildlife species; and
- (c) recommend modifications to appropriate implementation manuals or the development of new implementation manuals.

APPENDIX 20: PROVINCIAL ANNUAL REPORT ON TIMBER MANAGEMENT TO THE LEGISLATURE

1. The Annual Report on Timber Management shall include:
 - (a) a summary of Ontario's land and forest base;
 - (b) forest products industry statistics and harvest volumes;
 - (c) area harvested and average and maximum size of clearcuts;
 - (d) volume losses due to natural forces categorized according to insects, disease, fire, blowdown, others;
 - (e) government revenues from stumpage and area charges.
 - (f) spending for maintenance and construction of primary, secondary and other roads; spending for regeneration, tending and protection by treatment method.
 - (g) forecast and actual spending on tending and regeneration pursuant to Condition 38(a);
 - (h) a summary of management activities; and a summary of silvicultural effectiveness in the form of areas assessed for Free-to-Grow status, areas declared Free-to-Grow and condition survey results; and
 - (i) a summary of the monitoring (compliance, effects and effectiveness) results, including a summary drawn from Annual Reports, prepared for each forest management unit in accordance with Appendix 18.
 - (j) results of negotiations with Aboriginal peoples pursuant to Condition 77 including statistics describing licences and resource allocation to Aboriginal peoples, on a district basis.
 - (k) a summary of major problems identified by independent audits as provided in Condition 86;
 - (l) a list of all Timber Management Plans currently in preparation and those which are expected to be initiated in that year including a tentative list of starting dates;
 - (m) kilometres of primary and secondary roads constructed, maintained, gated, signed or physically or naturally abandoned;
 - (n) incidents of washouts of water crossings on access roads in Areas of Concern as provided in Condition 52(d) and the status of criteria specified in Condition 52(e);

- (o) merchantable and unmerchantable timber wastage by volume and species pursuant to condition 78(b)(ii); and
- (p) progress reports on the following scientific research, technical development programs and policy development programs which MNR has undertaken:

Condition 27 Clearcut size and configuration monitoring;

Condition 52(e) Water crossing removal criteria development;

Condition 94(b) Environmental Guidelines for Timber Management Activities;

Condition 94(c) Pine Marten and Piliated Woodpecker habitat guidelines;

Condition 96 Silvicultural effectiveness monitoring initiatives;

Condition 97 Forest Ecosystem Classification Program;

Condition 98 Northern Ontario Wetlands Evaluation System;

Condition 99 ANSIs;

Condition 100 Growth and Yield Studies;

Condition 101 Full Tree Harvest / Long term Productivity;

Condition 102 Tending and Protection improvement Program;

Condition 103 Old Growth;

Condition 104 Socio Economic analysis;

Condition 106 Roadless Wilderness Areas Policy;

Condition 107 Landscape Management, Biodiversity, HSA;

Condition 108 Geographic Information Systems; and

Condition 110 District Land Use Guidelines.

APPENDIX 21: CENTRAL RECORDS ON ANNUAL PESTICIDE USE

1. The central records on annual pesticide use for timber management purposes on Crown Lands in Ontario shall include:
 - (a) purpose of the application;
 - (b) product used and amount used;
 - (c) area treated;
 - (d) type of application;
 - (e) known incidents during the application; and
 - (f) a record of health and other reported complaints associated with chemical spraying from workers and the public.

APPENDIX 22: STATE OF THE FOREST REPORT

1. The State of the Forest Report shall include:
 - (a) an update of the "Forest Resources of Ontario, 1986", including a summary of age class distribution by working group for each MNR Region;
 - (b) a summary of the preceding five "Annual Reports on Timber Management", including a provincial overview and summary of silvicultural effectiveness drawn from data contained in the Annual Reports;
 - (c) wood supply synopses and projections by management unit, Region and cover type, and a description of typical strategies used to address wood supply concerns;
 - (d) a discussion of wood supply as related to the purpose of the undertaking;
 - (e) an estimate of the change in forest growing stock during the five-year term;
 - (f) a description of progress on improvement of implementation manuals, advances in information collection and management, and scientific research and technical development; and
 - (g) a description of relevant provincial-level problems and issues anticipated over the next five years, and a description of any programs or projects expected to be implemented or enhanced to address those problems and issues.
 - (h) the effectiveness of the timber management planning process in terms of
 - (i) average and maximum elapsed time required to prepare and approve individual Timber Management Plans,
 - (ii) estimates of average preparation costs and actual time invested for individual Timber Management Plans.
 - (iii) a summary of minor and major amendments to approved Timber Management Plans since the last Report, including a record of input from Local Citizens Committees concerning the categorization of Plan amendments and
 - (iv) a complete record of all bump-up requests, and their disposition since the last Report.
 - (i) the approved and updated Timber Production Policy pursuant to Condition 105(d);
 - (j) conclusions on the success of meeting non-timber management objectives for the forest management unit;

- (k) forecast and actual spending on tending and regeneration pursuant to condition 38(a);
- (l) summary of the major unresolved problems associated with visual resources as provided in Condition 24; and
- (m) area harvested and average and maximum size of clearcuts.

APPENDIX 23: CONTINUING EDUCATION AND TRAINING

1. Training programs shall be developed, or further developed, in the following subject areas:
 - (a) the timber management planning process and its application;
 - (b) the application of implementation manuals;
 - (c) data collection requirements and methodologies;
 - (d) those analytical methods for assessing social and economic advantages and disadvantages of timber management activities which are applicable to Ontario's timber management operations, (as described in Condition 104);
 - (e) monitoring requirements and methodologies;
 - (f) the results of relevant scientific research;
 - (g) other specific professional and technical training in specific subject areas, as training needs are identified from time to time;
 - (h) expand training for woodland workers to cover all implementation manuals and aspects of TMP that MNR believes would be useful for field operations.

APPENDIX 24: AMENDMENTS TO THE APPROVAL FOR THE UNDERTAKING

1. The following procedure shall apply in cases where an amendment to the approval for the undertaking is required:
 - (a) MNR will submit a request for an amendment to the Director of the Environmental Assessment Branch, Ministry of Environment and Energy. MNR shall describe the amendment being requested, shall provide the reasons for the request, and will provide any additional documentation which MNR considers appropriate or necessary to support its request, including a summary of the results of the formal public consultation concerning the request which has been undertaken.
 - (b) The Environmental Assessment Branch, Ministry of Environment and Energy will review the requested amendment and submit the results of that review to the Minister of Environment and Energy. If the Minister of Environment and Energy determines that the requested amendment is reasonable, the Minister shall give notice to all parties to this Environmental Assessment, and any municipality or government ministry or agency which is potentially affected, and to the general public. A period of 30 days shall be provided for public comment prior to a decision on approval of the requested amendment.
 - (c) The Minister of Environment and Energy may approve the requested amendment, reject the amendment, or refer the amendment to the Environmental Assessment Board for a decision. In each case, the Minister shall give notice to all persons who made submissions in response to the public notice referred to in Appendix 24, section 1(b), and to the general public.

APPENDIX 25: INDEPENDENT AUDITS: TERMS OF REFERENCE

1. The five-year audits of forest management units shall:
 - (a) undertake a fair and objective review of five years of timber management activities for each forest management unit, namely:
 - (i) the preparation and approval of Timber Management Plans and the preparation and approval of annual work schedules within the timeframes specified and in accordance with this approval and the Timber Management Planning Manual
 - (ii) the achievement or progress towards the achievement of timber management objectives and targets for the forest management unit (planned versus actual)
 - (iii) the achievement or progress towards the achievement of the timber components of other resource programs (planned versus actual)
 - (iv) the conducting of timber management activities in accordance with the approved Plans or amendments to those Plans
 - (v) the preparation and submission of accurate annual reports as specified in the TPM.
 - (b) Examine the depletion records, silvicultural records, maps of cutover areas classed non-treatable and the road construction maps for the forest management unit with regard to their adequacy and their conformity with the records.
 - (c) Select and inspect harvest cuts, silvicultural projects and road construction projects which are typical of the techniques employed on the forest management unit for conformity with the approved Timber Management Plan and the field application of implementation manuals and silvicultural ground rules.
 - (d) Examine and report upon the relationship between the harvest and forest regeneration that has occurred on the forest management unit during the period of the review.
 - (e) Determine, for forest management audits managed under forest management agreements, whether the obligations of the FMA holder have been satisfactorily performed and recommend to the Minister of Natural Resources whether the remaining period of the agreement should be extended for a further term of five years.
 - (f) The independent auditors, in addition to the above, can investigate any matters they feel appropriate.

- (g) The independent auditors will highlight, in their written report, any problems, bad practices or negative results observed, and their recommended solutions.

WITNESS LIST

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
ABRAHAM, Dr. Kenneth	177-178, 387-388, 389-390, 391-393	MNR Panel XB, XVII Reply II Reply III Reply V	Ecosystem Scientist, Wildlife Research Section, Thunder Bay
ADAMS, Howard	311	Kenora S.H.	Manager, Devlin Timber Co., Keewatin, Ontario
ADAMS, Larry	205	Fort Frances S.H.	Owner, Fly-in Fishing Camp
ADAMSON, Bruce	118-119, 127-130, 133-135	MNR Panel XIV, XV	Regional Engineer, North Central Region
AGUONIA, John	368	Northwatch	Robinson-Huron Treaty
AGUONIA, Norman	368	Northwatch	Robinson-Huron Treaty
AIDELBAUM, Abe	234	Timmins S.H.	President, Association of Tree Farmers of Ontario
AIKEN, Herbert	364	OMAA Panel V	Assistant Deputy Minister (ret.), Northern Development & Mines
AIRD, Dr. Paul	382	Aird	Professor, Faculty of Forestry, University of Toronto
ALARY, Gilles	236	Hearst S.H.	Silva Forestry Services
ALARY, Raymond	236	Hearst S.H.	Silva Forestry Services
ALEXANDER, Charles	339-341	OFAH/NOTOA Panel II	Past President, OFAH
ALLIN, Dr. John	77-97, 97-107, 171-177	MNR Panels X, XI, XVII	Policy Development Coordinator, Fisheries Branch
ALTOBELLI, Enzo	235	Hearst S.H.	Kapuskasing District Labour Council, Vice President, Cdn. Paperworkers Union, Loc. 89
ALVERTS, Vic	204	Fort Frances S.H.	Chairman, Fort Frances Sportsmen's Club
AMBS, Jim	311	Kenora S.H.	Logging Contractor
ANDERSEN, Dr. Peter	39-41	MNR Panel V	President, Andersen Economic Research Ltd.

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
ANDERSON, Doug	311	Kenora S.H.	Regional Logging Industries, Dryden
ANDERSON, Marcie	311	Kenora S.H.	Regional Logging Industries, Dryden
ANDRE, Leo	334	Ottawa S.H.	Leo Andre Limited - Independent Loggers
ANDRE, Paul	334	Ottawa S.H.	Leo Andre Limited - Independent Loggers
ANSTESS, Dave	230	Sault Ste. Marie S.H.	Burchland Veneer, Thessalon
ARMSON, Kenneth	12-17, 18-28, 29-38, 72-77, 171-177, 391-393	MNR Panels II, III, IV, IX, XVII Reply V	Provincial Forester for Ontario (ret.)
ARMSTRONG, Paul	246-247	FFT Panel II	Cottage Owner, Lake Weslemkoon
ATATISE, Edward	317	GCT #3, Panel III	Lac La Croix First Nation
ATKINSON, Murray	188-189	OFIA/OLMA Panel III	President, Northern Wood Preservers & Great West Timber Limited
BAK, David	322	Thunder Bay S.H.	N.W. Ontario Trucking and Logging Association
BAKER, William	97-107	MNR Panel XI	Black Spruce Program Forester, Northwestern Ontario Forest Technology Development Unit
BALMER, Ann	304	CAPHC	Timber management Task Force, Cdn. Association of Professional Heritage Consultants
BALSILLIE, David	394	MNR Reply IV	MNR Assistant Deputy Minister, Policy Division
BANERJEE, Paul	319	GCT #3, Panel V	Director, Economic Policy Analysis Directorate, Economic Development Sector, Indian & Northern Affairs, Canada
BASKERVILLE, Dr. Gordon	164-169	EAB Witness	Dean, Faculty of Forestry, University of New Brunswick
BAX, Herb	372-376	MOE	President, KBM Forestry Consultants, Inc., Thunder Bay
BAXTER, Thomas	323	T.S.H. Baxter	Consultant, Thunder Bay
BEALL, Moya	378	OPSEU	Research Education Officer, OPSEU

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
BEARDY, Isaac	330	NAN/WINDIGO Panel 1Bearskin, First Nation	
BEARDY, Paul	330	NAN/WINDIGO Panel 1	Bearskin, First Nation
BEATTIE, Don	236	Hearst S.H.	Nord-Aski Inc. Frontier Development, Hearst
BEAUSHANE, Dave	205	Fort Frances S.H.	Owner, Fly-in Fishing Camp
BECK, Alfred	333	Ottawa S.H.	Pembroke Outdoor Sportsmen's Club
BEDARD, Mr.	311	Kenora S.H.	Local Road Board Association
BEECHEY, Joseph	52-60	MNR Panel VII	Life Science Specialist, Parks & Rec. Areas Branch
BELAIR, Reginald	236	Hearst S.H.	MP - Cochrane/Superior
BELANGER, Kevin	239	Geraldton S.H.	Regional Forester - Domtar
BELL, Chris	231	Espanola S.H.	Manitoulin Nature Club
BELL, Ted	232	Espanola S.H.	Trucker, Nairn Centre
BENDELL, Dr. James	292-295	FFT Panel IX	Professor, Faculty of Forestry, Lakehead University
BENNETT, Roy	234, 335	Timmins S.H. New Liskeard S.H.	Gogoma Tourist Outfitter Association
BENSON, Crandall	270-271, 274-281	FFT Panel V	Assistant Professor, Faculty of Forestry, Lakehead University
BERGMAN, Fred	307	Red Lake S.H.	Trapper - Retired
BERGMAN, Ron	307	Red Lake S.H.	Trapper
BILSBARROW, Marilyn	140	Dryden S.H.	Secretary, Patricia Region Tourist Council
BISSCHOP, Albert	135-155, 171-177, 177-178, 391-394	MNR Panels XV, XVII, XB Reply V Reply IV	Forest Resources Environmental Planner, Planning & Environmental Assessment Branch
BISSON, Donald	235	Hearst S.H.	Levesque Plywood Ltd.
BJORNAA, Olaf	326	OMAA Panel II	President, OMAA
BLACK, Raymond	331	Toronto S.H.	Private Citizen, St. Catharines
BLOUIN, Glen	333	Ottawa S.H.	Canadian Forestry Association
BLUE, Peter G.	231	Espanola S.H.	Leaseholder (Mining/Minerals)

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
BOISSINEAU, Gary	229	Sault Ste. Marie S.H.	Fur Harvester
BONIFERRO, Steven	229	Sault Ste. Marie S.H.	United Steel Workers of America
BOSWELL, Edward	180-181	OFIA/OLMA Panel I	President, E.B. Eddy Forest Products Limited
BOUCHER, Rene	233	Timmins S.H.	Mayor, Iroquois Falls
BOUDREAU, Albert	234	Timmins S.H.	Timmins Forest Products Limited
BRODEUR, Grant	205	Fort Frances S.H.	President, Ontario Silvicultural Contractors' Association
BRODHAGEN, Robert	140	Dryden S.H.	Tourist Outfitter, Lac Seul
BROWN, Frank	140	Dryden S.H.	Private Citizen
BROWN, William	306	OPFA	General Manager, Algonquin Forestry Authority
BROWNSHILL, John	234	Timmins S.H.	Minister, Anglican Church
BROZOWSKI, Dr. Roman	366	North Bay S.H.	Chair, Comprehensive Planning Council, Temagami
BUCK, Ken	231	Espanola S.H.	Mayor, Espanola
BUFFINGTON, Florence	204	Fort Frances S.H.	Lakehead and District CUPE Representative
BUNCE, Philip	196, 203, 206-210	OFIA/OLMA Panel VII	Management Forester, E.B. Eddy Forest Products Limited
BURGSTALER, Edward	140-141	Dryden S.H.	Private Citizen
BURT, Edward	231	Espanola S.H.	Farmer, Manitoulin Island
BURT, David	311	Kenora S.H.	Logging Contractor
BUSS, Michael	108-117	MNR Panels XII, XIII	Fish & Wildlife Specialist, Leslie Frost Centre, and Regional Ecologist, Algonquin Region
CALLAGHAN, Brian	387-388	MNR Panel II Sault Ste. Marie	Project Leader, Timber Production Policy
CAMPBELL, Dr. Robert	108-117	MNR Panels XII, XIII	Provincial Herbicide Specialist, Pest Mgmt. Section, Sault Ste. Marie
CANFIELD, Don	205	Fort Frances S.H.	Fort Frances Sportsmen's Club
CANTIN, Jacques	235, 335	Hearst S.H. New Liskeard S.H.	Levesque Lumber
CARBONNEAU, Yvan	236	Hearst S.H.	Villeneuve Construction Co. Ltd.

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
CARLSON, Hugh	308	CASIT	Reeve of the Township of Red Lake
CARLETON, Dr. Terry	382	Carleton	Associate Professor, Faculty of Forestry, University of Toronto
CARLYLE, Greg	231	Espanola S.H.	Northern Ontario Logging and Trucking Association
CARON, Jean-Pierre	233	Timmins S.H.	Sawmill Operators, Timmins
CARON, Paul	233	Timmins S.H.	President, Caron Lumber
CARPENTER, Roy	314-316	GCT #3, Panels II, III	Director, Indian Forestry Development Program
CARR, Dr. William	342-344	OFAH/NOTOA Panel III	Manager, Consulting Division/Consultant, TERRASOL
CARRIERE, Gaston	232	Espanola S.H.	Independent Logger, Noelville, Ontario
CARROW, J.R.	196, 203, 206-210, 332	OFIA/OLMA Panel VII Toronto S.H.	Professor and Dean, Faculty of Forestry, University of Toronto
CARY, John	29-38, 156-163	MNR Panels IV, XVI	Senior Project Advisor, Planning & Environmental Assessment Branch
CASALETTO, Vic	232	Espanola S.H.	Forest Products Manager, Espanola
CHEECHOO, Ben	330	NAN/WINDIGO Panel I	Grand Chief, Constance Lake First Nation
CHEFF, Dennis	236	Hearst S.H.	Hearst Forest Management Inc.
CHICAGO, Kelvin	321	GCT #3, Panels III, VI	Chief, Lac Des Mille Lacs First Nation
CHURCHER, Joseph	108-117, 131-133, 135-155	MNR Panels XII, XIII, XIV, XV	Provincial Forest Entomologist, Pest Mgmt. Section, Sault Ste Marie
CLARK, Cameron	52-60, 77-97, 97-107, 171-177	MNR Panels VII, X, XI, XVII	Policy Officer, Northern Ontario; also Project Manager, Timber EA Project
CLOUTHIER, Thomas	334	Ottawa S.H.	Ottawa Valley Forest Industry Alliance
CLOUTIER, Roland	235	Hearst S.H.	Past President, Hearst Lumberman's Association
COATS, James	377	OFA	Executive Vice President, Ontario Forestry Association

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
COKE, Alison	39-41	MNR Panel V	Senior Economist, Planning & Environmental Assessment Branch
COMBA, Dave	232	Espanola S.H.	Director of Northcare
CONEGAN, Albert	320	GCT #3, Panel III	Big Grassy First Nation
COOMBS, Barbara	378	OPSEU	Vice-Chair, Employee Relations Committee, Thunder Bay, MNR
COPPEN, William	308	CASIT	Owner, Loon Haunt Lodge
COAT, Diane	238	Geraldton S.H.	Secretary, Beardmore-Lake Nipigon Watchdog Society
COTE, Robert	238	Geraldton S.H.	Beardmore-Lake Nipigon Watchdog Society
COX, Bernie	205	Fort Frances S.H.	Tourist Operator
CRAIG, Gordon	211-213, 216-219	OFIA/OLMA Panel IX (a)	Manager, Beak Consultants Limited
CRAIG, John	232	Espanola S.H.	President, Noelville District Rod & Gun Club
CRANE, Lorraine	330	NAN/WINDIGO Panel I	Slate Falls, First Nation
CROFTS, Mark	332	Toronto S.H.	Campbellcroft - Resident
CROMARTY, Dennis	330	NAN/WINDIGO Panel I	Big Trout Lake, First Nation
CRYSTAL, Melvin	43-51	MNR Panel VI	Coordinator, Native Issues, Corporate Policy & Planning Secretariat
CUMING, David	304	CAPHC	Timber Mgmt. Task Force, Canadian Association of Professional Heritage Consultants
DAFCIK, Wendel	311	Kenora S.H.	Crow Rock Camps, Lake Of The Woods
DAHL, Darlene	372-376	MOE	Planner, Provincial Unit EA Branch, MOE
DAKIN, Robert	205	Fort Frances S.H.	President, OPSEU, Local 711
DANIELS, Harry	326	OMAA Panel II	Senior Advisor to OMAA
DANIS, Fernand	232	Espanola S.H.	Independent Loggers of Ontario
DANSEREAU, Claire	377	IWA - Canada	President, International Woodworkers of America-Canada
DASCHUK, Judy	234	Timmins S.H.	Scott Lake Cottagers Association

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
DAVISON, Roger	135-155	MNR Panel XV	Timber Management Planning Specialist, Algonquin Region
DESGROSEILLIERS, Real	236	Hearst S.H.	Hearst Skidders Association
DESPRES, Gerry	236	Hearst S.H.	President, Hearst Anglers & Hunters Voyageur Club
DICAIRE, Armand	232	Espanola S.H.	CPU - Local 156
DICKENSON, Len	333	Ottawa S.H.	Lanark & District Fish & Game Conservation Club
DICKSON, Bud	205, 359-362	Fort Frances S.H. OFAH/NOTOA Panel IX	President, Founder & Manager, Canoe Canada Outfitters
DIEBEL, Bob	231	Espanola S.H.	Private Citizen
DOCKSTATER, Dr. Mark	371	Northwatch	Institute of Environmental Research
DOLCETTI, Jerry	364	OMAA Panel V	Senior Planner, Proctor & Redfern, Sault Ste. Marie
DOUGLAS, Larry	3-11	MNR Panel I	Director, Planning & Environmental Assessment Branch (now Corporate and Planning Secretariat)
DRAGER, Floyd	307	Red Lake S.H.	Mechanical Supervisor, Draco Logging
DUBE-VEILLEUX, Suzanne	339-341	OFAH/NOTOA Panel II	Tourism Co-ordinator, NOTOA
DUCHESNEAU, Denis	230	Sault Ste. Marie S.H.	Logging Operator
DUGGAN, Mark	311	Kenora S.H.	Councillor, Kenora
DUNCANSON, John	39-41, 171-177, 331	MNR Panels V, XVII, Toronto S.H.	Director, Senior Financial Analyst, McCarthy Securities Ltd.
DUNK, Dr. Thomas	379-380	CPU	Associate Professor, Department of Sociology & Centre for Northern Studies, Lakehead University
DUPUIS, Julie	236	Hearst S.H.	Private Citizen
EBBS, John	306	OPFA	Executive Director, Ontario Professional Foresters' Association
EEDY, Dr. Wilson	211-213, 216-218	OFIA/OLMA Panel IX (a)	Wildlife Biologist and Principal, Beak Consultants Limited

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
EDMONDS, Dan	238	Geraldton S.H.	Canadian Paperworkers Union, Local 441
ELLIOTT, Arthur	364-365	OMAA Panels IV, V	4 Winds Development Company
ELLIOTT, Robert	97-107	MNR Panel XI	Deputy Regional Director, Program Control, Southwestern Region
ERICKSON, Melvin	329	Sioux Lookout S.H.	Silver Falls Contractor, Kaministiquia, Ontario
ESQUEGA, Tim	371	Northwatch	Gull Bay First Nation
EULER, Dr. David	77-97, 105, 156-163, 171-177	MNR Panels X, XI, XVI, XVII	Habitat Development Coordinator, Wildlife Branch
EVERLEY, Edward	300	CASIT	District Manager, MNR Red Lake District (ret.)
EVERSON, Richard	230	Sault Ste. Marie S.H.	Fly In Fishing Lodge, Air Dale Air Service, Wawa
FAHLGREN, Ed	309	CASIT	Commissioner, The Royal Commission on the Northern Environment (ret.)
FEDORCHUK, Robert	322	Thunder Bay S.H.	Professional Forester
FENWICK, James	140	Dryden S.H.	Independent Loggers
FERGUSON, Murray	196, 198-203, 210	OFIA/OLMA Panels VII, VIII	Management Forester, Thunder Bay Woodlands, Canadian Pacific Forest Products Ltd.
FINLAY, John B.	331	Toronto S.H.	Conservation Committee Grassroots, Woodstock
FLEET, Robert	135-155	MNR Panel XV	Forest Management Supervisor Timmins District
FOBISTER, Steve	321	GCT #3, Panels III, VI	Grassy Narrows First Nation & Grand Chief, GCT #3
FOUCAULT, Leo	232	Espanola S.H.	Former Espanola Mayor (ret.)
FOURNIER, Jules	236	Hearst S.H.	LeCours Lumber, Hearst
FOX, Charles	330	NAN/WINDIGO Panel I	Bearskin, First Nation
FOX, Jane	234	Timmins S.H.	Birchill Forest Renewal Centre, Cochrane
FRASER, Doug	368	Northwatch	Teacher, Haileybury
FROMAN, Wendell	332	Toronto S.H.	Chief, Six Nations Iroquois Confederacy

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
FRY, Richard	219-228	OFIA/OLMA Panel X	Chief Forester, Eastern Division, Buchanan Forest Products Limited
FRYER, Dwight	366	North Bay S.H.	President, Mid-North Forest Industry Alliance
GAGNON, Gilles	235	Hearst S.H.	Mayor - Hearst
GALLOWAY, Robert	108-117	MNR Panel XII	Regional Forestry Specialist, Northern Region and Manager, Northern Ontario Forest Technology Development Unit
GAMBLE, Sam	234	Timmins S.H.	Town Council, Kirkland Lake
GARDNER, Arnold	321	GCT #3, Panel III	Chief, Eagle Lake First Nation
GEMMELL, Roderick	190-193, 198-202	OFIA/OLMA Panels IV, V, VIII	Assistant Logging Superintendent, Iroquois Falls, Woodlands Division, Abitibi-Price Inc.
GEORGESON, Keith	205	Fort Frances S.H.	Contractor, Boise Cascade
GERICKE, Wolf	329	Sioux Lookout S.H.	President, McKenzie Forest Products, Thunder Bay
GIBB, James A.	233	Timmins S.H.	Tourist Operator
GINTER, Kim	205	Fort Frances S.H.	President, CPU, Local 324
GODBOUT, Mr.	334	Ottawa S.H.	Stone Consolidated Inc.
GOLDS, Jerry	231	Espanola S.H.	High School Teacher (ret.)
GORDON, Bob	232	Espanola S.H.	Publisher & Editor of Mid-North Monitor
GORDON, David	29-38, 156-163, 391-393, 394	MNR Panels IV, XVI Reply IV Reply V	Policy Officer, Access Roads Section, Land Mgmt. and Environmental Monitoring Coordinator, Planning & Environmental Assessment Section, Corporate Policy & Planning Secretariat
GOULET, Joan	307	Red Lake S.H.	Bookkeeper, L & M Contracting
GOURILUK, Arthur	308	CASIT	President, Red Lake Trapping Council
GRAHAM, George	236	Hearst S.H.	Hearst Forest Management Inc.
GRANT, Peter	335	New Liskeard S.H.	Grant Forest Products, Englehart, Ontario
GRANTBOISE, Frank	311	Kenora S.H.	Sportsman Conservation Club
GRAVELINES, Laurie	391-393	MNR Reply V	MNR Resource Economist

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
GRAVES, Terry	368	Northwatch	Legal Researcher, New Liskeard
GRAY, Tim	331	Toronto S.H.	Executive Director, Wildlands League
GREENWOOD, Richard	77-97, 97-107, 177-178, 391-393	MNR Panels X, XI, XB, XVII MNR Reply V	Environmental Assessment Coordinator, Forest Resources Group
GREGORY, Stephen	329	Sioux Lookout S.H.	Private Citizen
GRONDIN, Louise	236	Hearst S.H.	Companion Motel, Hearst
GROVES, Richard	135-155	MNR Panel XV	Forest Management Super. Red Lake District
GUENETTE, Gilles	366	North Bay S.H.	West Nipissing Access Group
GUINDON, Fernand	235	Hearst S.H.	Malette United Sawmills Ltd., Hearst
HALLIKAINEN, Andrew	236	Hearst S.H.	President, Kapuskasing Rod and Gun Club
HAMPTON, Howard	205	Fort Frances S.H.	NDP-MPP - Rainy River
HANDERSON, Clarke	311	Kenora S.H.	Private Contractor
HARASYMIW, Dan	232	Espanola S.H.	OPSEU Area Representative
HARDING, Ray	232	Espanola S.H.	Reeve, Township of Nairn
HARRISON, Jack	329	Sioux Lookout S.H.	Operations Forester, Boise Cascade Canada, Kenora, Ont.
HEDMAN, Jack	205	Fort Frances S.H.	Fort Frances Sportmen's Club
HEIN, Harold	238	Geraldton S.H.	Private Citizen
HENDERSON, Janice	317	GCT #3, Panel III	Chief, Stangecoming First Nation
HENDERSON, Dr. Ross	305	FFT Panel II	Cottager, Cache Lake
HENRIKS, Barbara	238	Geraldton S.H.	Councillor, Township of Manitouwadge
HERBERT, Larry	307	Red Lake S.H.	Logging Operator
HILL, David	331	Toronto S.H.	Association of Temagami Youth Camps
HILL, Ken	332	Toronto S.H.	Six Nations Iroquois Confederacy
HILLIS, Jim	231	Espanola S.H.	H & R Fabris Industries, Elliott Lake
HILSINGER, Jim	230	Sault Ste. Marie S.H.	Owner, Water Tower Inn, Sault Ste. Marie

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
HIPEL, Gordon	231	Espanola S.H.	Private Citizen
HLADY, Greg	140, 204, 329	Dryden S.H., Fort Frances S.H., Sioux Lookout S.H.	Representative, People Interested in a Natural Environment
HODGINS, Dr. Bruce	369	Northwatch	Professor of History, Trent University
HOGG, David	97-107, 118-119, 127-130, 133-135	MNR Panels XI, XIV, XV	Wildlife Program Advisor, Planning & Environmental Assessment Branch
HOLLETT, Vern	329	Sioux Lookout S.H.	Sioux Lookout/Hudson Tourist Outfitters Association
HOLZKAMM, Dr. Tim	312-313	GCT #3, Panel I	Ethnohistorian, Treaty & Aboriginal Rights Research, Grand Council of Ojibway Chiefs, Kenora
HOMENUCK, Peter	371	Northwatch	Institute of Environmental Research
HOOK, Jim	312	Kenora S.H.	Lawyer, Kenora
HOPKINS, Donald	193-196	OFIA/OLMA Panel VI	Logging Superintendent, Iroquois Falls Woodlands Division, Abitibi- Price
HORLEY, Robert	311	Kenora S.H.	Logger and Guide
HOWE, Laura	140	Dryden S.H.	Bird Naturalist Columnist, Dryden Observer
HUGGETT, Ian	334	Ottawa S.H.	Director, Ecowatch
HUITIKKA, Bob	311	Kenora S.H.	Wilderness Air Services, Vermillion Bay
HUTCHINSON, Dr. Thomas	240-246	FFT Panel I, IA	Chair, Environmental & Resource Study Program, Trent University
HYNARD, Peter	77-97, 97-107, 108-117	MNR Panel X, XI, XII, XIII	Management Unit Forester, Minden District
IMADA, Sandra	188-189	OFIA/OLMA Panel III	Research Scientist, Abitibi-Price Inc.
INGWERTSON, Kathy	335	New Liskeard S.H.	Private Citizen, Henwood
INGRAM, Cecille	231	Espanola S.H.	President, Espanola and District Chamber of Commerce
INNES, Michael	191, 219-228	OFIA/OLMA Panels IV, X	Manager of Forestry, Abitibi-Price Inc.

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
IRWIN, Tim	231	Espanola S.H.	Espanola Game & Fish Protective Association
ISKRA, Edward	108-117	MNR Panel XII, XIII	Timber Resource Technician, Dryden District
JACKSON, Allan	229	Sault Ste. Marie S.H.	Chief Administrative Officer, Sault Ste. Marie
JAMES, Richard	331	Toronto S.H.	Private Citizen, Toronto - Retired
JANEWAY, Grant	231	Espanola S.H.	Mayor, Township of Massey
JEWELL, Ted	236	Hearst S.H.	Mayor Kapuskasing
JOHANSSON, Inge	380	CPU	Environment Officer, Swedish Forest Workers' Union
JOHNSON, Brad	303	NOACC	Councillor, Township of Golden
JOHNSTON, Dean	366	North Bay S.H.	Columbia Forest Products Limited, Rutherglen
JOHNSTON, Donald	192-196	OFIA/OLMA Panels V, VI	Logging Superintendent, Lakehead Woodlands Division, Abitibi-Price Inc.
JONES, Donald	315-316	GCT #3, Panel III	Director, Indian Forestry Development Program
JONES, Eric	334	Ottawa S.H.	Stone Consolidated Inc.
JONES, Olean	311	Kenora S.H.	Rep. Local Scout Group
JONES, Terry	231	Espanola S.H.	Private Citizen, Espanola
JONES, Tommy	140	Dryden S.H.	Mayor of Dryden
JORGENSEN, Dave	204	Fort Frances S.H.	Rainy River & District Logging & Safety Association
JOURDAIN, Steve	321	GCT #3, Panel III	Chief, Lac La Croix First Nation
KAPEL, John	251-252	FFT Panel II	Remote Tourist Lodge Operator, Brunswick Lake
KAVANAUGH, Francis	314-316	GCT #3, Panels II, III	Director, Indian Forestry Development Program
KAVANAUGH, Kevin	331	Toronto S.H.	World Wildlife Fund
KELLY, Richard	320	GCT #3, Panel III	Onegaming First Nation
KENNEDY, Frank	52-60, 97-107, 135-155, 177-178, 385-394	MNR Panels VII, XB, XI, XV, XVII Reply I - V	Environmental Assessment Coordinator, Forest Resources Group - and Manager, Environmental Section, Forest Resources Group, Sault Ste. Marie

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
KENRICK, John	43-51	MNR Panel VI	Deputy Reg. Director, Program Control, Northern Region
KENT, Clement	322	Thunder Bay S.H.	Private Citizen - Retired
KERR, Yvonne	229	Sault Ste. Marie S.H.	Bridgeland Lake Cottagers Association
KING, Daniel	384	Venture	Director, Venture Tourism Association of Ontario
KING, Hector	365	OMAA Panel IV	President, Armstrong Métis Association
KINGSBURY, Peter	120-126, 131-132	MNR Panel XIII, XIV	Environmental Impact Project Leader, Canadian Forestry Service, Forest Pest Management Institute (ret.)
KLUG, Elizabeth	205	Fort Frances S.H.	Big Timber Logging Company Ltd.
KOISTINEN, Robin	366	North Bay S.H.	Assistant Stewardship Director, Teme-Augama Anishnabai First Nation
KORPELA, Owen	236	Hearst S.H.	Shallow Lake Camping/Missinaibi Outfitters
KOSLOWSKI, Ron	307	Red Lake S.H.	Logging Contractor, Ontario/Minnesota Pulp and Paper
KOVALL, George	311	Kenora S.H.	Jaffray-Melick Town Council
KOWALCHUK, Bill	366	North Bay S.H.	Director of Planning, Township of Lake of Bays, District of Muskoka
KRISHKA, Cindy	108-117	MNR Panels XII, XIII	Vegetation Management Forester, Pest Management Section, Sault Ste. Marie
KROCHAK, Dennis	348-349	OFAH/NOTOA Panel V	Principal, TAEM Ltd.
KUBURSI, Dr. Atif	356-358	OFAH/NOTOA Panel VIII	Principal, Econometric Research Ltd.
LACROIX, Normand	235	Hearst S.H.	Kenogami Lake Lumber, Hornepane, Ontario
LAFRANCE, Monique	236	Hearst S.H.	La Maison Verte
LAFRENIERE, Robert	180-181	OFIA/OLMA Panel I	Vice-President, Corporate Indian Affairs & Sawmill Division Manager, A.L. Lafreniere Lumber Ltd.

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
LAJUNESSE, G.P.	234	Timmins S.H.	Small Logging Operator, Cochrane, Ontario
LAMY, Michelle	236	Hearst S.H.	La Maison Verte
LANE, John	231	Espanola S.H.	MPP for Algoma/Manitoulin 1971-1987
LARONDE, Mary	366	North Bay S.H.	Stewardship Director, Teme- Augama Anishnabai First Nation
LASTHEELS, Kerry	330	NAN/WINDIGO Panel I	Osnaburgh, First Nation
LATIMER, Blake	140	Dryden S.H.	Private Citizen
LAVALLEE, Bob	322	Thunder Bay S.H.	Canadian Paperworkers Union, Local 528, Thunder Bay
LAVOIE, Edgar	238	Geraldton S.H.	Beardmore-Lake Nipigon Watchdog Society
LAWRENCE, John	366	North Bay S.H.	Ontario Silvicultural Contractors Association
LECOURS, Denis	236	Hearst S.H.	LeCours Lumber, Hearst
LECUYER, Jim	232	Espanola S.H.	Small Logging Contractor, Iron Bridge, Ontario
LEE, Ormond	334	Ottawa S.H.	Tree Planting Contractor
LEE, Ron	231	Espanola S.H.	Sudbury Game & Fish Club
LESCHIED, Justus	140	Dryden S.H.	Local Angler and Hunter
LESCHUK, Stan	303	NOACC	Reeve of Ear Falls
LESIUK, John	307	Red Lake S.H.	Private Citizen, Masden, Ontario
LESLIE, Jill	331	Toronto S.H.	Federation of Ontario Hiking Trail Associations
LEVAC, Alfred	366	North Bay S.H.	West Nipissing Access Group
LEVESQUE, Marc	235	Hearst S.H.	Levesque Lumber, Hearst
LEVIGNE, Bruce	205	Fort Frances S.H.	President, Northern Wilderness Outfitters
LEY, Keith	232	Espanola S.H.	E.B. Eddy Forest Products
LIPMAN, Richard	333	Ottawa S.H.	Canadian Institute of Forestry
LODGE LINDSAY, Paton	230	Sault Ste. Marie S.H.	Private Citizen, Thessalon
LOON, Donald	330	NAN/WINDIGO Panel I	Slate Falls, First Nation

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
LOON, Edith	330	NAN/WINDIGO Panel I	Osnaburgh, First Nation
LOOSEMORE, Fred	384	Venture	Director, Trailhead
LOVE, David	377	OFA	Past President, Ontario Forestry Association
LYONS, Dick	204	Fort Frances S.H.	Mayor, Fort Frances
MacDONALD, Craig	395	Venture	MNR Recreation Specialist Algonquin Park
MacDONALD, Duncan	378	OFL	Programs Coordinator, Ontario Federation of Labour
MacDONALD, Linn	180-181	OFIA/OLMA Panel I	Senior Executive Vice President, Paper Group, Abitibi-Price Inc.
MacINTYRE, Robin	370	Northwatch	(Member of a cooperative management planning team for Goulais River which is somewhat different from a typical local citizens' committee)
MacKAY, Gary	193-196	OFIA/OLMA Panel VI	Logging Engineer, Forestry Division, E.B. Eddy Forest Products
MacLACHLAN, Donald	230	Sault Ste. Marie S.H.	Outfitter, Wawa
MacLEAN, James	156-163	MNR Panel XVI	Director of Wildlife Branch, MNR
MAGEE, Ronald	188-189, 366	OFIA/OLMA Panel III, North Bay S.H.	Forestry Industry Consultant
MAKOWSKI, Cecil	379-380	CPU	National Representative, Canadian Paperworkers Union
MALETTE, Gaetan	234	Timmins S.H.	Woodlands Division, Malette Inc.
MALONEY, Brian	378	OPSEU	Timber Technician, Blind River Area Office, MNR
MAREK, George	253-266	FFT Panel III	Forestry Consultant, Beardmore
MARTIN, Herb	311	Kenora S.H.	Tree Planting Contractor
MARTIN, Marcus	233	Timmins S.H.	Private Citizen, Smooth Rock Falls
MASER, Chris	282-285	FFT Panel VI	Landscape Ecologist, U.S. Environmental Protection Agency
MASTERS, Jack	322	Thunder Bay S.H.	Mayor of Thunder Bay
MATHER, Viki	231, 366	Espanola S.H. North Bay S.H.	Naturalist

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
MATTHEWS, Douglas	331	Toronto S.H.	Woodlot Operator
MAZURSKI, Warren	322	Thunder Bay S.H.	Canadian Paperworkers Union, Local 39
McALPINE, Don	378	OPSEU	Unit Forester, Nipigon District Office, MNR
McCORMACK, Dr. Maxwell	196, 203, 206-210	OFIA/OLMA Panel VII	Research Professor of Forest Resources, University of Maine, College of Forest Resources
McCORMICK, Paul	331	Toronto S.H.	School Teacher - Niagara Falls
McCULLOCH, Tom	333	Ottawa S.H.	Forest Industries Survival Association
McGIE, Betty	230	Sault Ste. Marie S.H.	Watson's Algoma Vacations Ltd.
McGUIRE, Michael	365	OMAA Panel IV	President, Lake Nipigon Métis Association
McGUIRE, Patrick	327, 365	OMAA Panels III & IV	Founding Member, Beardmore/MacDiarmid
McINNES, Sonny	321	GCT #3, Panel VI	Executive Director, GCT #3
McINTYRE, Wilfred	377	IWA - Canada	Local 1-2693, Thunder Bay
McKAY, Frank	330	NAN/WINDIGO Panel I	Sachigo Lake, First Nation
McKEAN, David	232	Espanola S.H.	E.B. Eddy Forest Products
McKIBBON, George	330	NAN/WINDIGO Panel I	Senior Consultant, Ecologistics Ltd., Waterloo
McKINNON, Don	233	Timmins S.H.	Prospector
McLEOD, David	308	CASIT	Administrator, Red Lake Board of Education
McNAMEE, Dr. Peter	64-71	MNR Panel VIII	Associate Manager, Toronto Office ESSA; Senior Analyst Director/Partner ESSA
McNICOL, John	52-60, 105, 135-155, 177-178, 385-388	MNR Panels VII, XB, XI, XV, XVII Reply I Reply III	District Wildlife Biologist, Thunder Bay District & Provincial Guidelines Co-ordinator
McRAE, Ken	333	Ottawa S.H.	Canoto Fish & Hunt Club
MEAKIN, Geoffrey	229	Sault Ste. Marie S.H.	Independent Logging Contractor
MENARD, Marcel	236	Hearst S.H.	Private Citizen, Mattice, Ontario
METHVEN, Dr. Ian	193-196	OFIA/OLMA Panel VI	President, R/EMS Research Ltd.

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
MICHON, Harold	327	OMAA Panel III	Welder, Beardmore/MacDiarmid
MIDDLETON, John	292-295	FFT Panel IX	Associate Professor, Institute of Urban & Environmental Studies, Brock University
MILLETTE, Pierre	236	Hearst S.H.	Secretary/Treasurer, North Claybelt Community Futures, Kapuskasing
MILLSON, David	233	Timmins S.H.	Millson Forestry Service
MILLSON, Susan	233	Timmins S.H.	Millson Forestry Service
MIRANDA, Doug	141	Dryden S.H.	President, Dryden District Labour Council
MISEK, Margaret	326	OMAA Panel II	Planner, County of Oxford
MONZON, Richard	3-11	MNR Panel I	Assistant Deputy Minister Administration
MOORE, Pat	331	Toronto S.H.	Private Citizen, St. Catharines
MORRISSEAU, Harry	317	GCT #3, Panel III	Couchiching First Nation
MORRISON, Dennis	320	GCT #3, Panel III	Nickkousemencaning First Nation
MORRISON, George	232	Espanola S.H.	Forester (ret.)
MORRISON, Judy	320	GCT #3, Panel III	Nickkousemencaning First Nation
MORRISON, Peter	286-291	FFT Panel VII	Assistant Professor, Environmental & Resource Studies, Trent University
MORSE, Brad	325	OMAA Panel I	Professor of Law, University of Ottawa
MOSQUIN, Ted	381	Mosquin	Mosquin Bio-Information Ltd.
MOSQUITO, Rosie	330	NAN/WINDIGO Panel I	Bearskin, First Nation
MUIR, Murray	335, 369	New Liskeard S.H. Northwatch	Private Citizen, Lundy Township
MULLER, Robert	286-291	FFT Panel VII	Associate Professor of Economics, McMaster University
MULLIN, David	335	New Liskeard S.H.	Laginha Enterprises Ltd. Elk Lake
MULTAMAKI, Hartley	135-155	MNR Panel XV	Divisional Forester, Buchanan Forest Products Ltd.
MUNFORD, Rod	141	Dryden S.H.	Private Citizen

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
MUNRO, Dale	191, 219-228	OFIA/OLMA Panels IV, X	Chief Forester, Woodlands Division, Boise Cascade Canada Ltd.
MURPHY, Brad	322	Thunder Bay S.H.	CP Rail, Thunder Bay
MURPHY, Michael	334	Ottawa S.H.	Ottawa Field Naturalists' Club
MURRAY, Peter	190-196, 198-202	OFIA/OLMA Panels IV, V, VI, VII, VIII	Principal, Cambrian Forestry Services
NAWAKEESIC, John	330	NAN/WINDIGO Panel I	Osnaburgh, First Nation
NAWAKEESIC, Mary	330	NAN/WINDIGO Panel I	Osnaburgh, First Nation
NEARY, Bernie	372-376	MOE	Supervisor, Lake Management Studies, Limnology Section, Dorset Research Centre, MOE
NEAVE, David	345-347	OFAH/NOTOA Panel IV	Executive Director, Wildlife Habitat Canada
NEILL, Joyce	303	NOACC	President, Northwestern Ontario Associated Chambers of Commerce
NELSON, Edward	229	Sault Ste. Marie S.H.	Lake Weshago Cottage Owners Association, Chapleau
NEUMAN, Dr. Keith	339-341	OFAH/NOTOA Panel II	Senior Associate/Director of Public Opinion Research, Corporate Research Associates Inc.
NICHOLSON, Stephen	111-117	MNR Panels XII, XIII	President, Pestechon Inc. Director, Agricaire-Altair
NICKS, Brian	198-202	OFIA/OLMA Panel VIII	Silviculturalist, E.B. Eddy Forest Products Ltd.
NIXON, George	252	FFT Panel II	Outfitter, Megisan Lake
O'CONNOR, Michael	250	FFT Panel II	Trails Manager, Stokely Creek Ski Touring Centre
O'DETTE, Jack	333	Ottawa S.H.	Private Citizen
O'DONNELL, Ed	234	Timmins S.H.	Owner, Perry Lake Cottagers' Association
OGSDEN, Doug	231	Espanola S.H.	Member, Copper Cliff Rod and Gun Club
OLDFORD, Gordon	77-97	MNR Panels X, XI	Director, Forest Resources Branch, Sault Ste. Marie

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
OLIVER, David	273	FFT Panel II	Outdoor Recreationist, Sault Ste. Marie
OSBORN, Dr. John	18-28, 29-38, 156-163, 389, 390	MNR Panels III, IV, XVI MNR Reply	Supervisor, Forest Management Information System, Forest Resources Group
O'SHAUGHNESSY, Tom	233	Timmins S.H.	Private Citizen (ret.), Chapleau
PAGE, Dr. Richard	352-355	OFAH/NOTOA Panel VII	Scientist, Research Branch, Department of Lands & Forests, B.C.
PARE, Myriam	319	GCT #3, Panel V	Director, Political & Economic Project Analyst, Economic Development Sector, Indian & Northern Affairs, Canada
PARISE, Diane	236	Hearst S.H.	Secretary/Treasurer, Hearst Community Industrial Training Committee
PATCH, Jeffery	352-355	OFAH/NOTOA Panel VII	Regional Biologist, New Brunswick Department of Natural Resources
PATTERSON, Bob	395	Venture	MNR Recreation Technician, Temagami
PAYNE, Dr. Robert	266-269	FFT Panel IV	Associate Professor, Outdoor Recreation Department, Lakehead University
PEARSON, Jack	311	Kenora S.H.	Representing the Mayor of Kenora - Don Parfite
PELLOW, Bob	235	Hearst S.H.	Canadian Paperworkers Union, Region III, Local 89, Kapuskasing
PERRAULT, Brian	321	GCT #3, Panel VI	Fort Frances Area Tribal Chief
PERRY, Kent	192-193	OFIA/OLMA Panel V	Logging Operations Supervisor, E.B. Eddy Products Limited
PETIQUAN, Barnie	316	GCT #3, Panel III	Chief, Wabauskang First Nation
PILON, Richard	235	Hearst S.H.	Reeve, Township of Dubreuilville
PINKERTON, Curtis	335	New Liskeard S.H.	Elk Lake Private Hunting Group "Lady Dufferin Gang"
PINKERTON, Garfield	335	New Liskeard S.H.	President, Elk Lake Chamber of Commerce
PIZEY, Valerie	321	GCT #3, Panel III	Big Island First Nation
POATE, Chris	311	Kenora S.H.	Vice President, Kenora & District Chamber of Commerce

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
POLDMAA, Enn	229	Sault Ste. Marie S.H.	Bellvue Valley Bed and Breakfast
POLLOCK, Dr. John	366	North Bay S.H.	Archaeologist, Teme-Augama Anishnabai First Nation
POOLE, Dr. Peter	318	GCT #3, Panel IV	Consultant, Alcove, Quebec
PORIER, Gaston	311	Kenora S.H.	CP Forest Products, Camp 515, Atikokan, Ontario
POTSON, Archie	320	GCT #3, Panel III	Seine River First Nation
POULIN, Denis	233	Timmins S.H.	Timmins Chamber of Commerce
PRIOR, Louis	329	Sioux Lookout S.H.	Shell Canada Representative
PROVENCHER, Gerry	236	Hearst S.H.	Chairman, Economic Development Committee
PRYKE, Douglas	188-189	OFIA/OLMA Panel III	Engineering Consultant, Erin, Ontario
PTOK, Rudi	335	New Liskeard S.H.	Private Citizen
PURCHASE, Ron	366	North Bay S.H.	Ontario Federation of Snowmobile Clubs
PYZER, Gordon	52-60, 118-119, 127-130, 133-135	MNR Panels VII, XIV, XV	District Manager, Kenora District
QUEAU, Charles	311	Kenora S.H.	Evergreen Farms, Dryden
QUINBY, Dr. Peter	370	Northwatch	Assistant Professor, Wilfred Laurier University
QUINCE, Michael	204	Fort Frances S.H.	Logger
QUINN, Al	233	Timmins S.H.	Private Citizen, St. Charles
QUINNEY, Dr. Terry	345-347, 350-351, 359-362	OFAH/NOTOA Panels III, VI, IX	Provincial Coordinator, Fish and Wildlife Services, OFAH
RACHMAN, Dr. Nancy	214-215	OFIA/OLMA Panel IX (b)	Project Manager, Environ Corporation
RADFORTH, Dr. Ian	379-380	CPU	Associate Professor of History, University of Toronto
RAFTIS, Ambrose	335, 370	New Liskeard S.H. Northwatch	(Member of the Temiskaming Stakeholders Committee)
RANCOURT, Marcel	232	Espanola S.H.	Deputy Mayor, Espanola
RANKIN, Brent	229	Sault Ste. Marie S.H.	Mayor, Thessalon
REDDEN, Jim	141	Dryden S.H.	Consulting Geologist

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
REEVE, Larry	234	Timmins S.H.	Timmins Fur Council
RICE, John	329	Sioux Lookout S.H.	Member, Citizens for a Quality Environment Committee, Sioux Lookout
RICHARD, Jim	233	Timmins S.H.	Consultant, Overburden Exploration Services
RITTER, Dr. Leonard	120-126, 131-132	MNR Panels XIII, XIV	Chief, Pesticides Division, Health Protection Branch, Health & Welfare Canada
RIVARD, Brian	236	Hearst S.H.	Hornepayne Economic Development Community
ROBERTS, Stephen	331	Toronto S.H.	Private Citizen, Mississauga
ROBERTS, Winton	333	Ottawa S.H.	Ompah Conservation Association, Ompah, Ontario
ROBINSON, Mark	249	FFT Panel II	Member, Blind River District Advisory Council
ROBINSON, Robert	307	Red Lake S.H.	Tourist Operator, Vermillion Bay
ROBINSON, Victor	307	Red Lake S.H.	President, Ear Falls Contractors Ltd.
ROBSON, Dave	335	New Liskeard S.H.	Lady Evelyn Cottagers, Owners and Users Association
RODRICKS, Dr. Joseph	214-215	OFIA/OLMA Panel IX (b)	Principal, Environ Corporation
ROGERS, Malcolm	238	Geraldton S.H.	Mayor of Geraldton
ROLL, William	190-191, 193-196, 385	OFIA/OLMA Panels IV, VI OFIA Reply Panel I	Manager - Resource Dev., Great Lakes Region, Canadian Pacific Products Limited
ROSS, Michael	184-187	OFIA/OLMA Panel II	Economist, KPMG Peat Marwick
ROULSTON, Lorne	307	Red Lake S.H.	Logging Contractor, Ear Falls
RUNESSON, Ulf	322	Thunder Bay S.H.	Lakehead University Centre for the Application of Resource Information Systems
RUNIONS, Glen	333	Ottawa S.H.	Private Citizen
RUSSELL, Bill	233	Timmins S.H.	Ontario Trappers Association
SALTARELLI, Nickolas	188-189, 233	OFIA/OLMA Panel III Timmins S.H.	Superintendent Forestry and Control, Iroquois Falls Woodlands Division, Abitibi-Price Inc.
SANDERS, Jeff	140	Dryden S.H.	Staff Member, Dryden Tree Nursery

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SAYEAU, Pat	141, 309	Dryden S.H. CASIT	Councillor, Township of Red Lake
SCHIEFER, Dr. Karl	211-213, 216-218	OFIA/OLMA Panel IX (a)	Fisheries Biologist & Managing Director, Beak Consultants Ltd.
SCHNABLEGGER, John	229	Sault Ste. Marie S.H.	President, Local 133, Canadian Paperworkers Union, Beak Consultants Ltd.
SCHREIBER, John	230	Sault Ste. Marie S.H.	Air Dale Flying Service
SCHUURMAN, Garrett	232	Espanola S.H.	Logger, Iron Bridge
SCOTT, David	64-71	MNR Panel VIII	Southern Ontario Pesticide Coordinator
SCOTT, Douglas	303	NOACC	Special Advisor, Northwestern Ontario Associated Chambers of Commerce
SEDOR, Dan	231	Espanola S.H.	E.B. Eddy Forest Products, Espanola
SEGUIN, Raymond	234	Timmins S.H.	Canadian Paperworkers Union Region 3
SEPPALA, Bruno	204	Fort Frances S.H.	Forester (ret.)
SERGEANT, Christopher	333	Ottawa S.H.	Canadian Parks & Wilderness Society
SEYMOUR, Rocky	314-316, 320-321	GCT #3, Panels II, III	Director, Indian Forestry Development Program
SHANK, Michael	366	North Bay S.H.	West Nipissing Access Group
SHAWANA, Jean	369	Northwatch	Ojibwe First Nations Band
SHEEL, Roger	232	Espanola S.H.	Canadian Paperworkers Union, Region 3, Local 31
SHORE, Ken	231	Espanola S.H.	Private Citizen, Espanola
SIGNORETTI, Ken	378	OFL	Executive Vice-President, Ontario Federation of Labour
SIMMONS, Ron	314-316	GCT #3, Panel II	Manager, Indian Forestry Development Program
SIMMONS, Stanley	327	OMAA Panel III	Tradesman, Beardmore/MacDiarmid
SINCLAIR, Marvin	317	GCT #3, Panel III	Washagamis Bay First Nation
SKEATES, Douglas	384	Venture	Silva Associates International, Loretto

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SKENE, Bill	311	Kenora S.H.	Moose Creek Company, Oxdrift, Ontario
SKIDMORE, Judith	308	CASIT	Executive Vice-President, Northcare
SMART, John	235	Hearst S.H.	Granite Hill Lake Resort, Hornepayne, Ontario
SMITH, Charlie	232	Espanola S.H.	Farmer, Guide
SMITH, Owen	335	New Liskeard S.H.	Private Citizen
SMITH, William	196, 203, 206-210	OFIA/OLMA Panel VII	Freehold Land Supervisor, Lakehead Woodlands Division, Abitibi-Price Inc.
SMITH, Zane	296-302	FFT Panel X	Forest Manager, U.S. Forest Service (ret.)
SNIDER, Amphien	333	Ottawa S.H.	Teacher, Denby, Ontario
SNIEZEK, Joseph	229, 311	Sault Ste. Marie S.H. Kenora S.H.	Engineering Consultant
SOUTHWIND, Levi	371	Northwatch	Sagamok Anishnawbek Band
SQUIRES, Malcolm	190-191, 198-202, 322	OFIA/OLMA Panels IV, VIII Thunder Bay S.H.	Divisional Forester, Lakehead Woodlands Division, Abitibi-Price Inc.
ST. AMOUR, Henri	235	Hearst S.H.	Director, Zone 3, Ontario Trappers Association
ST. JULES, Sylvio	235	Hearst S.H.	Hearst Trappers Council
STANCLIK, George	196, 203, 206-210	OFIA/OLMA Panel VII	Forester, Iroquois Falls Woodlands Division, Abitibi-Price Inc.
START, Don	204	Fort Frances S.H.	Forester (ret.)
STEEDMAN, Dr. Robert	387-388	Lakehead University Panel II	Adjunct Professor, Department of School of Forestry
STEINKE, John	204	Fort Frances S.H.	President, Guide, Steinke Services
STEWART, Robert	359-362	OFAH/NOTOA Panel IX	Principal, Senior Environmental Consultant, TAEM
STONE, Gordon	230	Sault Ste. Marie S.H.	Canadian Institute of Forestry
STRAIGHT, William	64-71, 156-163	MNR Panels VIII, XVI	Deputy Regional Director, Program Planning, Northwestern Region
STUCKLES, Paul	307	Red Lake S.H.	Devlin Timber Representative, Kenora

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
SUFFLING, Dr. Roger	292-295	FFT Panel IX	Associate Professor, Urban & Regional Planning, University of Waterloo
SUOMU, Len	219-228	OFIA/OLMA Panel X	Chief Forester, Dryden Woodlands Division, Abitibi-Price Inc.
SUTHERLAND, Norman	333	Ottawa S.H.	Bancroft Fish & Game Club, Bancroft, Ontario
SUTTON, Michael	335	New Liskeard S.H.	Northern Prospectors Association - Kirkland Lake
TARDIFF, Andy	329	Sioux Lookout S.H.	Reeve, Ignace, Ontario
TAYLOR, Steven	229	Sault Ste. Marie S.H.	Voyageur Trail Association
TELEKI, Geza	371	Northwatch	Canadian Environmental Collaborative Ltd.
TENAGLIA, Serge	118-119, 127-130, 133-135	MNR Panels XIV, XV	Forest Management Supervisor, Wawa District
THERIAULT, George	234	Timmins S.H.	President, Air Ivanhoe Ltd., Foleyet, Ontario
THERRIEN, Fernand	311	Kenora S.H.	Therrien Forest Products
THOMAS, Brian	230	Sault Ste. Marie S.H.	Sault & District Anglers Association
THOMAS, Jack Ward	352-355	OFAH Panel VII	Team Leader & Chief, Research Wildlife Biologist, U.S. Dept. of Agriculture Forest Service, Science Division
THOMPSON, Dr. Ian	383	Thompson	Research Scientist, Forestry Canada, St. John's, Newfoundland
THOMSON, Allan	311	Kenora S.H.	Xylem Contracting, St. Embro, Ontario
THUNDER, Richard	311	Kenora S.H.	Islington Band Council
TIGESON, Mel	307	Red Lake S.H.	Tourist Operator, Vermillion Bay
TOMCHICK, Robert	196, 203, 206-210, 366	OFIA/OLMA Panel VII North Bay S.H.	Chief Forester, Ontario Woodlands, Quebec and Ontario Paper Co. Ltd.
TOWER, Lucie	378	OPSEU	Seeding Research & Stock Quality Technician, Thunder Bay Forest Nursery, MNR
TRAHAN, Robert	235	Hearst S.H.	Chairman, Rotary Club Branch Supervisor, Canada Employment Centre, Hearst

WITNESS	TRANSCRIPT VOLUME NO.	PARTY/PANEL SAT. HEARING	TITLE/ AFFILIATION
TREUSCH, David	311	Kenora S.H.	Lake-of-the-Woods Development Corporation
TRUDEAU, Donald	366	North Bay S.H.	Tembec Forest Products
TRUDEAU, William	369	Northwatch	Wikwemikong First Nation
TULLOCH, Barrie	232	Espanola S.H.	Tulloch Trucking Company, Iron Bridge, Ontario
TUNNICLIFFE, Grant	247-248	FFT Panel II	President, Marceau Lake Cottagers Association
TWORZYANSKI, Thomas	156-163	MNR Panel XVI	Director, Canadian Council, Forest Minister Secretariat, Forest Resources Group
UHLIG, Peter	389-390	MNR Reply III	Forest Ecologist, Ontario Forest Research Institute
VAN AMELSFOORT, Liz	230, 366	Sault Ste. Marie S.H. North Bay S.H.	Independent Loggers of Ontario, Northcare
VAN DUYN, Herman	322	Thunder Bay S.H.	Owner, Hills Greenhouses, Thunder Bay Tree Seedling Growers Association
VICTOR, Peter	356-358	OFAH/NOTOA Panel VIII	Principal, VHB Research & Consulting Inc.
WADDELL, James	190-191, 198-202	OFIA/OLMA Panels IV, VIII	Manager of Forest Resources, E.B. Eddy Forest Products Ltd.
WAGNER, Robert	391	MNR Reply Panel III	MNR Forest Scientist, Sault Ste. Marie
WAGNER, Stan	234	Timmins S.H.	Private Citizen
WAISBERG, Leo	312-313	GCT #3, Panel I	Ethnohistorian, L.G. Waisberg Consulting Services
WAITO, Barry	230	Sault Ste. Marie S.H.	Lajambe Forest Products, Sault Ste. Marie
WAITO, Ronald	97-107, 387-388	MNR Panel XI Reply Panel II	Regional Silvicultural Program Forester, North Central Region
WAKEGIJIG, Ron	369	Northwatch	Wikwemikong First Nation
WALKER, Mrs. Al	233	Timmins S.H.	Independent Logger, Connaught
WALL, George	233	Timmins S.H.	Chairman, Land Use Environmental Committee
WALLACE, Lawrence	335	New Liskeard S.H.	Grenfell Road Commission, Kenogami

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WALLIS, Marg	329	Sioux Lookout S.H.	Vice President, Canadian Paperworkers Union, Local 1323, Dryden
WALSH CRAIG, Peggy	368	Northwatch	Managing Director, Canadian Environmental Plant Foundation
WAPACHEE, Fred	236	Hearst S.H.	Chief, Moose Factory First Nation
WARD, Neville	52-60, 118-119, 127-130, 133-135	MNR Panels VII, XIV, XV	Regional Fisheries Biologist - Northwestern Region
WARD, Paul	387-388	MNR Sault Ste. Marie Reply Panel II	Science & Technology Coordinator, Aviation, Flood & Fire Management Branch
WARNER, Charles	234	Timmins S.H.	President, Aide Creek Gardens, Englehart
WATSON, Cam	184-187	OFIA/OLMA Panel II	Principal, C.N. Watson and Associates Ltd.
WATT, Robert	389-390	MNR Reply Panel III	Habitat Specialist/Program Biologist, Northern Forest Development Group, MNR
WATTS, Paul	314-316	GCT #3, Panels II, III	Director, Indian Forestry Development Program
WELCH, Andy	333	Ottawa S.H.	Dendron Resource Surveys Ltd. - Marketing Manager
WELYHORSKYJ, Myroslaw	231	Espanola S.H.	Private Citizen, Espanola
WELIN, Denis	233	Timmins S.H.	Mayor of Timmins
WELSH, Dr. Daniel	383	Welsh	Ontario Region, Canadian Wildlife Service
WENBORN, Dean	231	Espanola S.H.	French River Resort Association
WETELAINEN, Henry	326	OMAA Panel II	Vice President, OMAA
WHISSEL, Claude	235	Hearst S.H.	Canadian Paperworkers Union, Local 90, Iroquois Falls
WHITFIELD, Tom	366	North Bay S.H.	Forestry Consultant, Teme- Augama Anishnabai First Nation
WILKINS, Tony	231	Espanola S.H.	Lawyer, Espanola
WILMERING, Hal	141	Dryden S.H.	Teacher, Angler, Hunter
WILSON, Collette	366	North Bay S.H.	Mayor, Mattawa
WILSON, Hap	369	Northwatch	Freelance Artist/ Writer/Photographer

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WILSON, Les	329	Sioux Lookout S.H.	International Woodworkers Association, Local 2693
WILSON, Walter	333	Ottawa S.H.	Ompah Conservation Association, Ompah, Ontario
WILSON, Willie	314-316	GCT #3, Panels II, III	Chairman, Indian Forestry Development Program
WISNESKI, Marvin	141, 307	Dryden S.H. Red Lake S.H.	Tourist Operator, Vermillion Bay
WIWCHAR, Larry	335	New Liskeard S.H.	Comprehensive Planning Council, Temagami & Latchford CMUs
WOGENSTAHL, Gary	141	Dryden S.H.	Tourist Operator
WOOD, Jim	333	Ottawa S.H.	Western Canada Wilderness Committee - Ottawa Branch
WRIGHT, Charles	192-193	OFIA/OLMA Panel V	Operations Super., McChesney Lumber Division, E.B. Eddy Forest Products Ltd.
YOUNG, Wayne	219-228, 333	OFIA/OLMA Panel X Ottawa S.H.	Superintendent of Forest Management, Domtar Inc. Cornwall, Ontario
YURICK, Ron	370	Northwatch	(Remote Tourist Operator and former Planner for MNR)
YZERDRATT, Walter	238	Geraldton S.H.	Geologist, Athens, Ontario
ZANDARIN, Andy	231	Espanola S.H.	Private Citizen
ZEPPA, Dave	230	Sault Ste. Marie S.H.	North Shore Logging and Trucking Association
ZORN, Rudolph	192-193	OFIA/OLMA Panel V	Construction Superintendent, Canadian Pacific Forest Products Limited
ZORZETTO, Paul	236	Hearst S.H.	Municipal Council, Mattice - Val Coté
ZUBRICK, Gordon	335	New Liskeard S.H.	Longpoint Cottagers Association, Haileybury
ZUCHLINSKI, Jerry	331	Toronto S.H.	Private Citizen

